REVISED AUGUST KNOB SALVAGE ENVIRONMENTAL ASSESSMENT

EA Number OR-118-06-009
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United States Department of the Interior
Bureau of Land Management
Medford District
Glendale Resource Area

Lead Agency: Bureau of Land Management

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Abstract:

The Glendale Resource Area, Medford District, Bureau of Land Management (BLM) proposes to salvage fire killed trees and fell hazardous trees within the area burned from the Blossom Fire of 2005. The Planning Area (PA) is located on Oregon and California (O & C) Revested Lands within matrix, late successional reserve (LSR) and riparian reserve (RR) land allocations approximately 20 miles west of the community of Glendale. The legal description and PA boundary is Township (T) 32 S, Range (R) 10 W, Sections 13, 23, 24, in the matrix portion and section 26 in the LSR portion; and T. 32 S, R. 9W, Sections 18 and 19 Curry County, Willamette Meridian.

This environmental assessment discloses the predicted environmental effects of two alternatives, the Proposed Action and the No Action Alternative. The Proposed Action includes salvage harvesting of dead and dying trees within two units totaling 12 acres on matrix lands. Scattered fire killed and hazard trees within 75 feet of existing roads and dozer firelines in the matrix would be harvested. The only activity planned in the LSR and RR is felling hazard trees which would be left on site. Roadside and dozer fireline felling would occur along five segments totaling approximately 58 acres. Other forest activities include construction of a cable harvest landing, re-opening and reconstructing a temporary spur road and decommissioning it after use, lopping and scattering logging vegetative debris back on site and road maintenance that would clean up roadside logging debris after harvest.

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FINDING OF NO SIGNIFICANT IMPACT

Based upon review of the EA (Environmental Assessment #OR-118-06-009) and supporting project record, I have determined that Alternative 2 (Proposed Action) and the one Mitigation Measure are not major federal actions and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

Context. The Proposed Action is a site-specific action directly involving approximately 70 acres of BLM (Bureau of Land Management) Oregon and California (O & C) administered land that by itself does not have international, national, region-wide, or state-wide importance. The Proposed Action includes six sections within the Blossom Fire and Mule Creek Hydrologic Unit Code 6 (HUC 6) sub-watershed on matrix, late successional reserve and riparian reserve land use allocations. It is also within northern spotted owl critical habitat, marbled murrelet critical habitat and a Medford District elk management area.

The discussion of the significance criteria that follows applies to the intended actions and is within the context of local importance. Chapter 3 of the EA details the effects of the Proposed Action and the Mitigation Measure. None of the effects identified, including direct, indirect and cumulative effects, are considered to be significant and do not exceed those effects described in the *Medford District Resource Management Plan/Final Environmental Impact Statement* (June 1995).

Intensity. The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

1. Impacts may be both beneficial and adverse. The predicted environmental effects of the Proposed Action and Mitigation Measure, most noteworthy, include:

a) social and economic benefits by providing a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability;

b) the Proposed Action, including the reconstruction of a temporary access and haul road on the east side of unit 2, the building of one 0.2 acre landing, and the felling and extraction of timber within units 2 &3 and along the proposed roads and dozer cat line, would result in approximately 2.0 acres of soil disturbance throughout the 70 acres in which activities within this Planning Area would occur. This would reduce soil productivity on no more than 1.0 acres of matrix land within this 19,563 acre HUC 6 sub-watershed. Given the scope of the project, the Proposed Action is anticipated to have a negligible impact to soil productivity and erosion rates at the watershed scale. It would be expected that productivity would be increased on several acres of ground within Units 2

and 3, as areas that currently consist of only dead trees would be planted with young trees and logging slash spread throughout the unit salvage units would provide an important source of soil nutrients that were lost during the Blossom Fire. Compaction would not exceed 12%, and productivity loss would not exceed 5%, within any one unit, or within the Planning Area as a result of this action. This would keep impacts from compaction and productivity within those levels assessed under the Medford Resource Management Plan. Road maintenance and haul activities would be expected to result in a minimal amount of erosion. These activities would be seasonally restricted to the dry season, and most roads were recently re-graded following the Blossom Fire minimizing the need for road surfaces to be bladed and thus erosion. Where hydrologically connected to streams, native surface or gravel roads that would be maintained post harvest and used for haul are not in close proximity to fish habitat.

A minimal amount of increased sediment would be expected to enter streams as a result of this project due to upslope yarding corridor disturbance, however, eliminating direct routing mechanisms through best management practices (BMPs) and project design features (PDFs) would allow upslope erosion to be filtered out within the soil rock fragments, ground litter, and riparian vegetation (where present). This would reduce the amount of sediment that enters the stream at any one time, and it would be expected that the minimal sediment that did make it to the stream would generally be transported during rain on snow, or severe rainstorm events, when flows are high. Because higher streamflows can carry more sediment and still remain in dynamic equilibrium, minimal amounts of sediment, such as would be expected under this project, typically become immeasurable above natural levels in terms of stream turbidity increases, stream sediment loads, or the amount of downstream sediment deposition.

For the Mitigation Measure, this would reduce the amount of disturbed soil by yarding corridors by approximately 0.2 acres. An additional 0.2 acres of soil would not be disturbed or compacted as a result of the temporary landing construction proposed under alternative 2. Reducing the amount of disturbed soils would also reduce the amount of material that would be prone to erosion by approximately 0.4 acres. Productivity losses from yarding corridors and the temporary landing construction would also be reduced under this mitigation measure, from approximately 1 acre to 0.8 acres.

c) See effects to ESA threatened and endangered species in criteria # 9 below.

None of the environmental effects disclosed above and discussed in detail in Chapter 3 of the EA are considered significant.

2. The degree to which the selected alternative will affect public health or safety.
Public health and safety under the Proposed Action and Mitigation Measure would be improved because the risk of hazard trees falling on persons using roads within the Planning Area would be substantially reduced. The Proposed Action is comparable to other timber harvest projects which have occurred within the Glendale Resource Area with no unusual health or safety concerns. Responses to public scoping comments are found in Appendix 3. No public health or safety risks were identified in those comments.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas. There are no prime farm lands, wetlands, wild and scenic rivers or wilderness located within the Planning Area. Cultural surveys were completed for the August Knob Salvage Planning Area and no sites were found. As such, cultural resources would not be affected. If cultural resources are located during the implementation of an action, the project would be redesigned to protect the values present. The Rogue River, a designated Wild and Scenic River, is located approximately 6 miles downstream from the Planning Area. Because of the distance away, the scale of the Proposed Action and the PDFs none of the proposed activities would have any effect on the Outstandingly Remarkable Values (ORV) of the Rogue Wild and Scenic River (scenery, fisheries, water-based recreation).

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial. The effects of the Proposed Action and Mitigation Measure on the quality of the human environment are adequately understood by the interdisciplinary team to provide analysis for the decision. The one letter of comment was analyzed by the August Knob Salvage interdisciplinary team. While comments, such as other scientific research, were mentioned by the public, the actions of the Proposed Action are within those identified in the RMP and the predicted effects are contained in Chapter 3 of the EA. BLM fully responded to these comments in Appendix 3 and none of the comments were considered controversial in respect to their context and intensity in determining significance.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks. The Proposed Action and Mitigation Measure are not unique or unusual. The BLM has experience implementing similar actions in similar areas and have found effects to be reasonably predictable. The environmental effects to the human environment are fully analyzed in Chapter 3 of the EA. There are no predicted effects on the human environment which are considered to be highly uncertain or involve unique or unknown risks. The August Knob Salvage project received one letter of comment and no unique or unknown risks were identified.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. The Proposed Action and Mitigation Measure do not set a precedent for future actions that might have significant effects nor does it represent a decision in principle about future consideration. The Proposed Action and Mitigation Measure would occur within the matrix, late successional reserve and riparian reserve land allocations. Chapter 1 of the August Knob Salvage EA identifies how the actions are consistent with the Purpose and Need and compliance with higher level EIS documents. Chapter 3 evaluates the effects of the Proposed Action and Mitigation Measure and the findings are that all projects proposed would be compliant with the effects anticipated under the Medford RMP. Any future projects would be evaluated through the NEPA (National

Environmental Policy Act) process and would stand on their own as to environmental effects.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. The interdisciplinary team evaluated the Proposed Action and Mitigation Measure in context of past, present and reasonably foreseeable actions. Significant cumulative effects outside those already disclosed in the *Medford District Resource Management Plan/Final Environmental Impact Statement* are not predicted. A complete disclosure of the effects of the Proposed Action is contained in Chapter 3 of the EA.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. The Proposed Action and Mitigation Measure would not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the Proposed Action cause loss or destruction of significant scientific, cultural, or historical resources.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973. The Proposed Action and Mitigation Measure would have no effect on Southern Oregon/Northern California coho or coho critical habitat (CCH) because 1) temperature and shade would not be affected, 2) sediment input would not affect coho or CCH, and 3) recruitment of large woody debris (LWD) would not be effected to the extent which would affect stream processes. The closest roadside hazard tree removal to CCH is approximately 0.6 miles from CCH in Arrastra Creek. Unit 2 is located approximately 2.1 miles from CCH in Arrastra Creek. Any sediment entering the intermittent stream as a result of yarding operations in unit 2 would not result in a change of CCH, affect coho behavior, or food sources in CCH in Arrastra Creek because of the distance (2.1 miles) of CCH downstream from the unit, the Project Design Features (PDFs), and the minimal amount of sediment which could reach the intermittent stream. Unit 3 is located approximately 1.3 mile from CCH in Mule Creek. There are no riparian reserves located within unit 3 so shade, temperature, and future LWD recruitment would not be affected. No mechanisms exist for sediment to be delivered to CCH in Mule Creek. The haul and road maintenance associated with the proposed hazard and salvage tree removal would not cause sediment to reach CCH because of the proximity of stream crossings to CCH and PDFs such as restricting wet season hauling. The closest stream crossing on a gravel or natural surface haul road to CCH is approximately 0.6 miles to Arrastra Creek

Harvesting would have a very small potential from noise of disrupting spotted owl nesting behavior and thereby having a potential indirect effect to the owls that might be nesting in the old growth stand to the north of Unit 2 or close to the roadside units. Seasonal restrictions for actions that would disturb this species would constrain operations and prevent likely disturbance from noise above the ambient level. The

Proposed Action, which includes a seasonal restriction from March 1 to June 30 for chainsaw work within 195 feet or heavy equipment use within 95 feet of spotted owl nesting habitat, would likely prevent negative effects. Units, landings and yarding corridors contain no suitable nesting, roosting and foraging (NRF) for spotted owls. Only Unit 3 has an area that may serve as dispersal habitat and would continue to do so following harvest.

Northern spotted owl critical habitat would not be affected because while the proposed action is within spotted owl critical habitat, there are no effects to suitable spotted owl habitat because there would be no removal, downgrading or degrading of suitable habitat.

Harvesting would have an extremely small potential from noise of disrupting nesting behavior and thereby having a potential indirect effect to marbled murrelets that might be nesting in the old growth stand to the north of Unit 2 or close to the roadside units. PDFs impose seasonal and daily restrictions for actions that would disturb these species during the nesting seasons. Due to the PDFs, there would be minimal effect from the operations on nesting spotted owls or marbled murrelets in the nearby stands.

Only approximately one mile of roadside hazard tree removal is within designated Critical Habitat for the marbled murrelet within the PA. There is no nesting habitat for murrelets within the proposed treatments areas because of the lack of adequate canopy cover. Therefore felling along roads would not affect marbled murrelet critical habitat.

Fisher would not be affected because abundant numbers of snags and large down wood (more than twice the amounts called for on the Northwest Forest Plan (NFP) or Resource Management Plan (RMP)) would remain following harvest in the immediate vicinity of the proposed units. Thus, the ability of the area to retain and recruit adequate dead wood for future fisher habitat within the vicinity of the Planning Area would not be impaired. Units currently do not contain adequate cover for the species.

10. **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The Proposed Action and Mitigation Measure do not violate any known federal, state, or local law or requirement imposed for the protection of the environment. Furthermore, the Proposed Action is consistent with applicable land management plans, policies, and programs in section 1.5 of the EA.

Chapter 1.0 What Action is Proposed and Why?

1.1 Introduction

This environmental assessment (EA) will analyze the impacts of proposed forest management activities on the human environment in the August Knob Salvage Planning Area (PA). The EA will provide the decision maker, the Glendale Field Manager, with current information to aid in the decision making process. It will also determine if there are significant impacts not already analyzed in the Environmental Impact Statement for the Medford District's Resource Management Plan and whether a supplement to that Environmental Impact Statement is needed or if a Finding of No Significant Impact is appropriate.

Chapter 1 provides a context for what will be analyzed in the EA, describes the kinds of actions that will be considered, defines the PA, describes what the Proposed Action needed to accomplish, and identifies the criteria that will be used for choosing the alternative that will best meet the purpose and need for this proposal.

The analysis utilizes field data and ground verification by resource specialists to estimate acres, road miles and produce reference maps. Estimates are intended to aid the reader in understanding the Proposed Action. The reader should be aware that electronic technology can produce information that appears precise but is still dependent on further field work. During implementation, unit boundaries are posted and surveyed and unforeseen features, such as water sources, are appropriately buffered. It has been the experience for past Glendale Resource Area environmental assessments that estimates of treatment acres in the EA have been generally more than the actual acres treated on the ground.

1.2 Planning Area Location

The Planning Area is located approximately 20 miles west of the community of Glendale and two miles southeast of Mount Bolivar, a prominent landmark in the Glendale Resource Area. The PA is within the boundaries of the Mule Creek Hydrologic Unit Code (HUC) 6 sub-watershed and the Blossom Fire.

The legal description and PA boundary is Township (T) 32 S, Range (R) 10 W, Sections 13, 23, 24, in the matrix portion and section 26 in the LSR portion; and T. 32 S, R. 9W, Sections 18 and 19 Curry County, Willamette Meridian.

The PA includes the land use allocations of matrix, late successional reserve and riparian reserves. The Medford District Record of Decision and Resource Management Plan (RMP) allocated approximately 22 percent of the Medford District's land base to the matrix land use allocation (RMP, p. 72). Riparian reserves occur across all land use allocations and estimated to include 43% of the land base. This percentage is based on

prescribed riparian reserve widths and estimated miles of streams within all of the various land use allocations. Only hazard trees along road 32-10-26.1 and 32-10-26 in the late-successional reserve were included as part of the analysis in the PA. There are no treatments planned in the late successional reserve and riparian reserves except for hazard tree felling and lop and scattering of slash.

1.3 Proposed Action

The Proposed Action includes salvaging fire killed trees burned in the Blossom Fire of 2005 and removing or leaving hazardous trees (green or dead) along roads that are considered a risk to humans using these roads (See project maps in Appendix 6). These forest management treatments include salvage harvesting of dead and dying trees within two units totaling 12 acres on matrix lands. Scattered fire killed and hazard trees within 75 feet of existing roads and fire killed trees along dozer firelines in the matrix would be harvested. The only activity planned in the late successional reserve (LSR) and riparian reserve (RR) is felling hazard trees which would be left on site. Roadside and dozer fireline felling would occur along five segments totaling approximately 58 acres. For hazard trees that are more than 75 feet from roads, only those portions of those trees that land within 75 feet of the road would be harvested. Only salvage would occur within 75 feet of the dozer fireline. Other forest activities include construction of a cable harvest landing, re-opening and reconstruction of a temporary spur road and decommissioning it after use, re-opening one dozer fireline for salvage access and returning it to the same condition after salvaging, lopping and scattering logging vegetative debris back on site, and road maintenance work that would clean up roadside logging debris after harvest. Planting of conifer trees would occur on the one decommissioned road after use and if necessary in salvaged areas along the roads. Planting of conifer trees in Units 2 & 3 and the dozer fireline will be done through the Blossom Fire Rehabilitation and Stabilization categorical exclusion analyzed in 2005.

The harvest units are within lands governed by the O & C (Oregon and California) Revested Lands Act. Salvage harvesting and associated forest management activities are planned to occur between 2006 and 2007. BLM planning decisions and harvest activities would apply only to BLM-administered O & C lands.

1.4 Purpose and Need for the Proposal

1.4.1 Need for Action

The Blossom Fire of 2005 included approximately 1,669 of BLM managed lands. Salvage of fire killed trees would allow the BLM to retrieve some economic value from these trees and partially achieve RMP board foot volume commitments. There is also the need to fell hazard trees that are at risk of falling onto roads used by humans. The lands being harvested are on O & C lands. One of the primary objectives identified in the RMP is implementing the O & C Lands Act which requires the Secretary of the Interior to manage O&C lands for permanent forest production in accord with sustained yield principles (ROD/RMP, p.17).

1.4.2 Purpose (Objectives) for Action

Any Action Alternative to be given serious consideration as a reasonable alternative must meet the objectives provided in the RMP for projects to be implemented in the Planning Area. The RMP and statutes specify the following objectives to be accomplished in managing the lands in the Planning Area:

1. Produce a sustainable supply of timber and other forest commodities on matrix lands to provide jobs and contribute to community stability (RMP, p. 38) by:

    - recovering mortality volume that would otherwise be lost to decay (PRMP/EIS, p. 4-101)
    - remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites in LSRs (RMP, p. 33)
    - silvicultural systems that are economically feasible (RMP, p. 180)
    - mortality above the level needed to meet snag retention and other habitat goals and provide desired levels of coarse woody debris would be harvested (RMP, p.186).

1.4.3 Decision Factors

In choosing the alternative that best meets the purpose and need, the Glendale Field Manager would evaluate alternatives on:

- providing timber resources and revenue to the government from the sale of those resources;

- economic feasibility

- reducing the risk of hazard trees falling on roads used by humans.

1.5 Plan Conformance

This Proposed Action conforms to the:

- *Final Supplemental Environmental Impact Statement and Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (Northwest Forest Plan FSEIS, 1994 and ROD, 1994);
- *Final Medford District Proposed Resource Management Plan/Environmental Impact Statement* and *Record of Decision* (EIS, 1994 and RMP/ROD, 1995);
- *Final Supplemental Environmental Impact Statement: Management of Port-Orford-Cedar in Southwest Oregon* (FSEIS, 2004 and ROD, 2004);

- *Final Supplemental Environmental Impact Statement and Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and* Guidelines (FSEIS, 2000 and ROD, 2001) and amendments or modifications as of March 21, 2004;
- *Final Supplemental Environmental Impact Statement Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl and Proposal to Amend Wording About the Aquatic Conservation Strategy* (FSEIS, 2003 and ROD, 2004).
- *Medford District Integrated Weed Management Plan Environmental Assessment (1998*) and tiered to the *Northwest Area Noxious Weed Control Program* (EIS, 1985).

The *Wild Rogue North Watershed Analysis and the Southwest Oregon Late-Successional Reserve Assessment* is incorporated by reference. Watershed analysis is an analytical process and not a decision-making process as provided in the Record of Decision for the Northwest Forest Plan (p. B-20).

The Medford District is aware of ongoing litigation Pacific Coast Federation of Fishermen's Associations et al. v. National Marine Fisheries Service et al. (W.D. Wash.) related to the 2004 supplemental environmental impact statement for the Aquatic Conservation Strategy (ACS). The Magistrate Judge issued findings and recommendations to the court on March 29, 2006. The court has not found this amendment to be "illegal," nor did the Magistrate recommend such a finding. Given the court has not yet adopted the findings and recommendations, the BLM will appropriately continue to follow the current direction in the 2004 ROD, until ordered otherwise. The August Knob Salvage environmental analysis tiers to this document as the clarification of how to address the ACS. Since it was only a clarification, and did not alter any of the on-the-ground components of the standards and guidelines designed for achieving the ACS objectives, whether the court upholds the amendment or not should have little practical effect at the project level.

1.6 Permits and Approvals Required

No permits and approvals are required prior to project implementation. All timber hauling would be on BLM roads.

1.7 Scoping and Alternative Use of Resources

1.7.1 Public Scoping

The Glendale Resource Area accepts public comment of proposed forest management activities through the quarterly BLM Medford Messenger publication. This publication provides a brief description of proposed projects, such as August Knob, a legal location and general vicinity map are provided along with a comment sheet for public responses.

The August Knob Salvage project was included in the quarterly publication beginning in the winter of 2005. One letter of comment was received from Klamath Siskiyou Wildlands Center and responses to their comments are found under Appendix 3 of this EA.

1.7.2 Alternative Use of Resources

Conflicts with the Proposed Action were considered and identified in Appendix 1 and were analyzed to determine if an alternative action would be developed. Appendix 1 also explains why some alternatives were considered but not analyzed in detail and eliminated from further study.

1.8 Decisions to be Made

The Glendale Field Manager is the official responsible for deciding whether or not to prepare an Environmental Impact Statement (EIS), and whether to approve the treatments as proposed, not at all, or to some other extent.

Chapter 2.0 Alternative Ways of Accomplishing the Objectives

2.1 Introduction

This chapter presents the alternative ways of meeting the project objectives identified in Chapter 1, by describing and comparing the alternatives, including Alternative 1 (No Action Alternative) and Alternative 2 (Proposed Action) as specified in 40 CFR (Code of Federal Regulations) § 1502.14. Descriptions summarize potential environmental consequences and focus on potential actions and outputs. Project Design Features were identified and are included here to ensure project compliance with higher-level National Environmental Policy Act (NEPA) documents, laws and BLM guidelines.

Through the scoping process, the public provided comments that were considered by the interdisciplinary team and BLM responses are found in Appendix 3 (Public Comment to August Knob Salvage Scoping and BLM Response). There was no unresolved conflict concerning alternative uses of available resources identified by the interdisciplinary team (see **Appendix 1 for discussion**). As such, the alternatives that will be analyzed in detail in this EA include the No Action Alternative and the Proposed Action Alternative. One Mitigation Measure was analyzed that eliminated the construction of a new cable yarding landing.

2.2 Project Design Features

Project design features (PDFs) are specific measures included in the site specific design of Alternative 2 to eliminate or minimize adverse impacts on the human environment. These PDFs were developed by the August Knob Salvage interdisciplinary team from guidance of Best Management Practices (BMPs) identified in the Medford District ROD/RMP, Appendix D, and resource protection measures specific to the Planning Area.

2.2.1 Soil Productivity, Residual Trees and Coarse Woody Debris

- All trees to be yarded in cable units would be limbed and cut into lengths not to exceed 41 feet prior to yarding to minimize damage to residual trees.
- Woody debris from logging would be lopped and scattered in the unit.
- Directional falling toward the lead would be required on cable yarded units to minimize damage to residual (reserve) trees.
- All existing naturally occurring dead and down woody debris (prior to the Blossom Fire), greater than or equal to 16 inches diameter, would remain on site.

- Woody debris left on the landing would be scattered on the landing and the temporary road after decommissioning.

- Only mortality above the level needed to meet snag retention and other habitat goals and provide desired levels of coarse woody debris would be harvested (RMP, p.186).

2.2.2 Cultural Sites

- Surveys in Planning Area revealed no cultural sites. If cultural resources are found during project implementation, the project would be redesigned to protect the cultural resource values present, or evaluation and mitigation procedures would be implemented based on recommendations from the Resource Area archaeologist with concurrence from the Glendale Field Manager and State Historic Preservation Office.

2.2.3 Noxious Weeds

- Heavy equipment would be washed before initial move-in and prior to all subsequent move-ins into the Planning Area to remove soil and plant parts to prevent the spread of invasive and noxious weeds.

- Only logging and construction equipment inspected by the BLM would be allowed to operate within the Planning Area, or in the immediate vicinity of the Planning Area. All subsequent move-ins of logging and construction equipment would be treated the same as the initial move-in.

- Cleaning is defined as removal of dirt, grease, plant parts, and material that may carry noxious weed seeds and parts onto BLM lands. Cleaning prior to entry onto BLM lands may be accomplished by use of a water pressure hose.

- Logging and construction equipment would be visually inspected by a qualified BLM specialist to verify that the equipment has been cleaned.

- Native grass/forb seeding would be used on areas disturbed by the temporary road construction and landing to minimize the establishment of noxious weeds.

2.2.4 Streams and Riparian Zones

- Within riparian reserves, only those trees deemed as a hazard to falling on roads would be cut. If hazard trees are cut within riparian reserves they would be felled and left on site.

- For trees felled within Unit 2 that are within one tree length of riparian reserve boundaries, directional falling away from riparian reserves would be required. If

trees are accidentally felled into the riparian reserve, the portion of the tree that lies within the riparian reserve would be left in place, to prevent ground disturbance within the riparian reserve.

- Trees within riparian reserves that are accidentally knocked over during falling and yarding would be retained on site for fish /wildlife habitat.

- Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams. No re-fueling of any equipment would occur within 150 ft of streams or stream crossings.

- Refueling of chainsaws and other equipment would be done no closer than 150 feet of any stream or wet area. Spilled fuel and oil would be cleaned-up and would be disposed of at an approved disposal site.

2.2.5 Soil Compaction and Erosion

2.2.5.1 Soil compaction and erosion from logging.

- Yarding would only be allowed between May 15 and October 15 (during the dry season, typically) of the same year to minimize the amount of soil disturbance and compaction unless the Authorized Office approves extension for dry weather.

- All ground based equipment would be restricted to roads, dozer built firelines, and landings. No skid trails would be used or built.

- Landings with exposed soils would be winterized prior to Oct 15 unless the Authorized Officer approves extension for dry weather.

- In all locations where the mineral soil layer is exposed as a result of cable yarding activities within or along yarding corridors in unit 2, the exposed soil areas would be covered with fine logging slash and/or straw mulch. All yarding corridors would be water-barred as per the Medford RMP (p.167) water bar spacing guidelines to minimize erosion. Water bar outlets would be placed on convex slopes whenever feasible to maximize water dispersal. These activities would be required to be completed prior to Oct 15, or upon ceasing of the operations for the season, if this date is extended by Authorized Officer as a result of dry weather conditions.

- Logging slash of mixed sizes would be placed within the two ephemeral draws downslope of yarding corridors in the west side of unit 2. Several larger limbs would be placed within each draw at approximately 30 degrees to the contour and 50 feet apart to further reduce the transport of sediment downslope. These larger limbs will be required to be placed such that they exceed ½ of the width of the draw, and placed in contact with the surface throughout a majority of their length.

- Partial suspension (at a minimum) would be required on all units to minimize soil disturbance. Full suspension would be required if yarding is needed to cross unstable areas.

- Cable yarding lines would be respooled when changing yarding corridors.

- The number of yarding corridors would be minimized to reduce soil compaction and displacement from cable yarding. Corridors would be located approximately 150 feet apart at the tail end.

- Unit layout would restrict tractor yarding to slopes less than 35% in order to prevent excessive soil disturbance.

2.2.5.2 Soil Compaction and Erosion from Roads and Landings

- The temporary road that would be reconstructed to access units 2 & 3 would be discontinuously subsoiled (Davis, pp. 138 & 139) to a depth of at least 18 inches using a winged ripper, seeded, water-barred, mulched, and blocked during dry soil conditions, upon completion of harvest. Water bar spacing and drainage angles used to rehabilitate tractor skid trails would be based on the NWFP Standards and Guidelines erosion control measures for timber harvest which considers slope and soil series (RMP, p. 167).

- The one segment of dozer fireline reopened to remove dead and dying trees would be left in the same condition as prior to logging. Activities to rehabilitate the dozer lines would include, but are not limited to, all of the following: discontinuous subsoiling, water-barring, placing slash over the lines, and planting. These activities would be required to be completed prior to Oct 15, or upon ceasing of the operations for the season, if this date is extended by Authorized Officer as a result of dry weather conditions.

- Blading of ditchlines and the road surfaces would only be done to maintain or restore proper drainage.

- Landings would be sub-soiled following logging and planted with conifers. Exceptions would be where landings utilize existing road prisms, in which case the original roads would not be sub-soiled or planted. Adequate drainage would be provided to minimize erosion.

2.2.6 Special Status Wildlife Species and their Habitats

2.2.6.1 Northern Spotted Owl

- Any of the following PDFs may be waived in a particular year if nesting or reproductive success surveys conducted according to the U.S. Fish and Wildlife Service (USFWS) - endorsed survey guidelines reveal that spotted owls are non-nesting or that no young are present that year. Waivers are valid only until March 1 of the following year. Previously known well established sites/activity centers are assumed occupied unless protocol surveys indicate otherwise.

- Work activities (such as tree felling, yarding, hauling on roads not generally used by the public) would not be permitted within specified distances (see table 1 below from 2006 Biological Assessment), of any unsurveyed suitable habitat nest site or activity center of known pairs and resident singles between March 1 and 30 June (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center to be not occupied, non-nesting, or failed in their nesting attempt. March 1 – June 30 is considered the critical early nesting period; the restricted season may be extended during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt). The boundary of the prescribed area may be modified by the BLM using topographic features or other site-specific information. The restricted area is calculated as a radius from the assumed nest site (point).

Table 1 Harassment distances from various activities for spotted owls.

Type of Activity	**Distance at which spotted owl may flush or abort a feeding attempt**
chainsaws (hazard trees, precommercial and commercial thinning)	65 yards
heavy equipment	35 yards

2.2.6.2 Marbled Murrelet

Work activities (such as tree felling, yarding, road and other construction activities, and hauling on roads not generally used by the public) which produce noises above ambient levels would not occur within specified distances (see Table 2 below) of any occupied stand or unsurveyed suitable habitat between April 1 – August 5. For the period between August 6 – September 15, work activities would be confined to between 2 hours after sunrise to 2 hours before sunset.

Table 2 Specified distances for unsurveyed marbled murrelet suitable habitat

Type of Activity – Prescribed Distances for Marbled Murrelet	**Zone of Restricted Operation**
Chainsaws (hazard trees, tree harvest, etc.)	360 feet
Heavy equipment	360 feet

2.3 Description of the Alternatives

2.3.1 Alternative 1 (No Action)

The No Action Alternative provides a baseline for the comparison of the Proposed Action Alternative and describes the existing condition and the continuing trends within the Planning Area. Under the RMP, salvage was expected to occur within the matrix allocation (RMP, p. 74). Selection of this alternative would not meet the purpose and need of the project (described in Chapter 1) of recovering some economic value and partially achieving the Medford RMP board foot volume commitments at this time. Not felling hazard trees would not remove the risk of trees falling onto roads used by humans. Consideration of this alternative provides the answer to the question of what it would mean for the objectives not to be achieved. Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses.

2.3.2 Alternative 2 (Proposed Action)

The Proposed Action emphasizes fully meeting the matrix land allocation objectives of producing a sustainable supply of timber (RMP, p. 38); recovering mortality volume that would otherwise be lost to decay (PRMP/EIS, p. 4-101); harvesting tree mortality timber above the level needed to meet snag retention and other habitat goals and desired levels of coarse woody debris (RMP, p.186). Public health and safety under the Proposed Action and Mitigation Measure would be improved because the risk of hazard trees at risk of falling on persons using roads within the Planning Area would be substantially reduced. See project maps in Appendix 6

2.3.2.1 Timber Harvesting

The Proposed Action includes salvage harvesting of dead and dying trees within two burned areas totaling 12 acres and scattered fire killed and hazard trees (hazard trees can be green or dead) within 75 feet of existing roads within the matrix. For hazard trees that are more than 75 feet from roads, only those portions of those trees that fall within 75 feet of the road would be harvested. Only salvage would occur within 75 feet of the dozer fireline. Hazard trees felled in the LSR and riparian reserves would be left on site. This roadside felling would occur along four segments (B,C,D,E) of roads and one dozer fireline (segment A) totaling approximately 58 acres. Slash would be lopped and scattered back on site.

Dead and dying tress (Hazard trees hare considered to have a live crown ratio of less than ten percent. Within Units 2 and 3 a minimum of 1 dead/dying tree greater than 20 inches dbh per acre would be retained to meet snag requirements. For unit #2, dead/dying trees outside of the unit to the south and west will count towards meeting area snag requirements.

2.3.2.2 Timber Yarding

Harvest yarding systems under Alternative 2 include the use of skyline cable and tractor yarding. One cable harvest landing would be constructed and would be approximately one fifth acre in size. Approximately five to seven green trees 38" to 43' in diameter would be removed in the landing area.

2.3.2.3 Road Work

Approximately 1,600 feet of a temporary road would be reopened and reconstructed to access the landing for unit 2. The road would be decommissioned after use. The dozer fireline in segment A would be re-opened to salvage dead and dying trees and then returned to the same condition prior to opening. Road maintenance work would include cleaning roadside debris after harvest.

2.2.2.4 Reforestation

Planting of conifer seedlings would occur on the one decommissioned road after use and if necessary in salvaged areas along the roads. Planting of conifer trees in Units 2 & 3 and the dozer fireline will be done through the Blossom Fire Rehabilitation and Stabilization categorical exclusion issued in 2005.

Chapter 3.0 Affected Environment and Environmental Consequences

3.1 Introduction

In accordance with law, regulation, executive order, policy and direction, an interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter 2.0. Those elements of the human environment that were determined to be affected define the scope of environmental concern (**see Environmental Elements in Appendix 2 for full list of elements considered**). The Affected Environment portion of this chapter describes the current conditions in the August Knob Salvage Planning Area. The relevant resources that could be potentially impacted are soils, hydrology, northern spotted owl and marbled murrelet suitable habitat.

The Environmental Effects portion of this chapter provides the analytical basis for the comparisons of the alternatives (40 CFR § 1502.16) and the reasonably foreseeable environmental consequences to the human environment that each alternative would have on the relevant resources. Impacts can be beneficial, neutral or detrimental. This analysis considers the direct impacts (effects caused by the action and occurring at the same place and time), indirect impacts (effects caused by the action but occurring later in time and farther removed in distance but are reasonably foreseeable) and cumulative impacts (effects caused by the action when added to other past, present and reasonably foreseeable future actions on all land ownerships). The temporal and spatial scales used in this analysis may vary depending on the resource being affected.

As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the proposed action." Use of information on the effects on past action may be useful in two ways according to the CEQ guidance. One is for consideration of the proposed action's cumulative effects, and secondly as a basis for identifying the proposed action's direct and indirect effects. Past harvest activities have been accounted for under the satellite change detection data used to estimate harvesting the last few decades.

The CEQ stated in this guidance that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." This is because a description of the current state of the environment inherently includes the effects of past actions. The CEQ guidance specifies that the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." Our information on the current environmental condition is more comprehensive and more accurate for establishing a useful starting point for a cumulative effects analysis, than attempting to establish such a starting point by adding up the

described effects of individual past actions to some environmental baseline condition in the past that, unlike current conditions, can no longer be verified by direct examination.

The second area in which the CEQ guidance states that information on past actions may be useful is in "illuminating or predicting the direct and indirect effects of a proposed action." The usefulness of such information is limited by the fact that it is anecdotal only, and extrapolation of data from such singular experiences is not generally accepted as a reliable predictor of effects.

Scoping for this project did not identify any need to exhaustively list individual past actions or analyze, compare, or describe the environmental effects of individual past actions in order to complete an analysis which would be useful for illuminating or predicting the effects of the proposed action.

When encountering a gap in information, the question implicit in the Council on Environmental Quality regulations on incomplete and unavailable information was posed: is this information "essential to a reasoned choice among the alternatives?" (40 CFR §1502.22[a]). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established that any new information would not likely reverse or nullify understood relationships. Although new information would be welcome, no missing information was determined as essential for the decision maker to make a reasoned choice among the alternatives.

3.2 Soils and Water Quality

3.2.1 Affected Environment

This action is proposed within the 19,564 acre Mule Creek HUC 6 sub-watershed, located within the approximately 104,400 acre Rogue River/Horseshoe Bend HUC 5 watershed. The Mule Creek HUC 6 sub-watershed is located in the Klamath Mountains, and is formed of the Rogue and Dothan geologic formations, with thin bands of ultramafic rock. This Planning Area falls primarily with the Dothan formation and along a band of ultramafic rock which is part of an ophiolite sequence. The Dothan formation consists of oceanic continental slope rocks including sandstone, siltstone, and mudstone, along with chert and pillow lava. Where mudstones and siltstones occur within the Dothan formation translational and rotational slides have occurred. These slides, which occur naturally within this watershed, have been shown to partially block channels and deliver large pulses of sediment to streams. Areas with sandstone are generally stable, but can become infertile where fire or other disturbance mechanisms remove surface organics. The ultramafic band consists of peridotite, gabbros, pillow basalts, cherts, and clay, most of which have undergone metamorphism that has changed basalts into greenstone, and ultramafic rocks into serpentine. Serpentinized rocks weather quickly at the surface, and in some cases become prone to severe erosion.

The soils in the proposed treatment area have been mapped by the Natural Resource Conservation Service (NRCS, 1994) as being a Bobsgarden-Rilea-Euchrand complex throughout most of Unit 2, the Stackyards-Rilea-Eurhrand complex in the NW of Unit 2, and the Zalea-Pyrady-Yorel complex in the NE of Unit 2 and all of Unit 3. Soil survey information provided in the NRCS Curry County Soil Survey Manual revealed that these complexes are all similar in character. Soils in these complexes are all derived from metasedimentary and metavolcanic parent materials, except Pyrady which is mudstone derived, all have fairly deep soils, on all but the narrow summits and shoulders, are well drained, and typically have moderately slow permeability. The surface layer in these complexes can be prone to water erosion, displacement and accelerated erosion as a result of slower permeability, gravelly loam surface soil textures, and moderately steep slopes. The surface layers of these soils are also prone to compaction when wet. There are six different soils complexes which occur in areas where road salvage and hazard tree removal are proposed. These complexes generally have the same characteristics as those in the salvage units. They are derived of metasedimentary, metavolcanic, or mudstone parent materials, and are well drained. Soils within the roadside soils complexes range from slow to moderately rapid permeability, and generally consist of very gravelly loam surface layers with gravelly clay loam lower horizon between 7-12 inches below the surface. Soils within these complexes are prone to the same water erosion, displacement and accelerated erosion hazards as those soils within the proposed salvage units.

Common Disturbance Agents

Mining and milling operations, beginning in the late 19th century, have resulted in altered stream channel conditions, increased sediment deposits within the stream substrate, and altered riparian vegetation in the lower reaches of Mule Creek below this Planning Area. As a result of the geologic character of the Dothan formation, economic minerals are not commonly found within the Planning Area, and thus there are currently no known mining claims that would currently be affecting water quality. As a result, altered stream and riparian conditions associated with mining activities are presently improving.

Fire is a common disturbance within the Mule Creek HUC 6 sub-watershed, and within the Rogue River/Horseshoe Bend HUC 5 watershed. Fire records indicate that in the past 10 years 17 fires and numerous lightening strikes have been documented in the Rogue River/Horseshoe Bend HUC 5 watershed. Most recently the 2005 Blossom Fire encompassed approximately 11,800 acres within the Mule Creek HUC 6 sub-watershed. Approximately 6,000 of the acres within the Mule Creek HUC 6 sub-watershed did not burn, or burnt at a very low intensity, removing only fines. Another approximately 3,700 acres burnt at a low intensity, removing fines and small understory vegetation. On approximately 1,900 acres, moderate burn intensities killed a majority of the understory vegetation and created small patch openings within the forest canopy as a result of single tree torching or the removal of young plantations. The remaining approximately 200 acres that burnt within the Mule Creek HUC 6 sub-watershed during the Blossom Fire, burnt at high to extreme fire intensities resulting in small crown fires that consumed a majority of the understory vegetation, and killed nearly all the overstory trees within the stand. In areas where high to extreme fire behavior has occurred, increased sediment, and reduced areas of productivity are common.

Activities associated with timber harvest, including timber yarding, road building, road maintenance, and log haul have also caused soil and vegetation disturbance that has resulted in increased erosion and stream sedimentation. Currently there is no standard for stream health as related to sediment loads. Macroinvertebrate surveys that have been done within this HUC 6 sub-watershed indicate that water quality is generally in good condition, however larger fish bearing streams currently have higher levels of embeddedness than would be expected for a watershed of this nature under natural conditions (Wild Rogue North Watershed Analysis, 1999). Roads are the largest chronic sediment source in this HUC 6 sub-watershed. Road densities of 3.1 mi/mi^2 in the Mule Creek HUC 6 sub-watershed are currently in excess of NMFS recommended levels of 2.0 mi/mi^2 for properly functioning condition for salmonids. To reduce these road impacts, many native surface roads within this Planning Area are gated to restrict access during the winter months, considerably reducing stream sedimentation.

Soil and Water Elements Affected by Past Disturbance Agents

Soil Productivity Loss and Erosion

Soil productivity, in a forested setting, is primarily the soil's capacity to support plant growth as reflected by some index of biomass accumulation. Losing a soil's plant growth capacity also means losing the site's ability to sustain timber production and other important ecological values. Soil productivity is affected by soil bulk compaction, topsoil displacement, and by changes and reductions in soil nutrients. Litter, humus, soil wood, and certain key properties of the surface mineral layers of forest soils are most easily and commonly disturbed by yarding activities, yet they are crucial to forest productivity. Soil compaction reduces soil productivity and vegetation growth rate by decreasing soil porosity and increasing density, which in turn inhibits productivity by reducing water and nutrient holding capacity, root respiration, and microbial activity. Minimizing the amount of disturbance and compaction would generally improve stand development and watershed hydrology. The Medford District RMP/EIS provides a series of BMPs designed to prevent adverse levels of degradation to the soil resource and related productivity (Vol. 2, pp. 30). Heat resulting from high intensity burned areas can damage soil biology such as mycorrhizae, nitrifying bacteria, and other soil organisms in proportion to burn intensity, adversely affecting soil productivity for up to 10 years (Barnett, 1989). Medford District BMPs limit the amount of compaction to 12% of the harvested area, and limit productivity reductions to 5%.

At present the Mule Creek HUC 6 sub-watershed has approximately 695 acres (3.6%) of ground that has been disturbed by past harvest operations, roads, and dozer and hand constructed fire breaks created during the Blossom Fire (Medford Change Detection, 1974-2002, field observations, and BLM past projects data). Disturbance estimates were calculated by taking the total acres harvested by each yarding type, multiplied by a research derived percentage for the amount of disturbance created as a result of each of the various yarding techniques. These values were then converted into the percentage of acres that were disturbed within the HUC 6 sub-watershed (disturbed acres divided by total watershed acres). Megahan (1980) and Amaranthus (1981) found that clearcut

tractor logging disturbed 21% of the ground and that clearcut harvest cable yarding disturbed 7%. For past disturbance the total amount of disturbed soil was calculated assuming that 60% of the units were tractor logged clearcuts, and the rest were cable yarded clearcuts, as clearcut logging was historically the most common harvest technique used on both public and private land. This is an over-estimate because over 50% these acres have stands that are over 20 years of age, so some reduction in bare soil, top soil erosion, and compaction has occurred as a result of revegetation.

A total of 2.7% (537 ac) of Mule Creek HUC 6 sub-watershed is estimated to presently be compacted as a result of timber management activities, existing roads, and dozer firelines created during the Blossom Fire. Disturbed ground was estimated to be 75% compacted on tractor units, and 60% compacted on cable units, based on research from Sidle, 1980 (EPA Non-Point Pollution Website). Road acres were assumed to be 100% compacted, and are based on a 20 foot road width. Dozer firelines were assumed to be 40% compacted due to rehabilitation measures that were implemented following the fire.

Productivity loss from past harvest, road construction, and the Blossom Fire within this sub-watershed is approximated to be approximately 3.0%. Productivity loss from timber harvest related compaction and topsoil disturbance was calculated as 50% of the disturbed area within units, based primarily on research by Froehlich and McNabb (1983), a 40% loss on dozer firelines due to estimated existing compaction, a estimated 50% on high intensity burned acres from the Blossom Fire due to heating of the soil and a loss of soil organics, and calculated as a 100% reduction in productivity on road acres.

Water Quality

The Planning Area for this proposed project drains into the tributary streams of Arrastra Fork Mule Creek and East Fork Mule Creek. Fish distribution in this Planning Area is limited by natural barriers such as high gradient stream channels, low summer flows, a lack of spawning gravel, and numerous streamside slides and bedrock falls (Wild Rogue North WA, 1999) which are a result of the geologic characteristics of this watershed. These frequent slides raise the natural sediment levels that occur within streams in this sub-watershed. Tributary streams in this Planning Area are generally confined channels that are quite steep, with gradients in excess of 20%. These tributary streams also tend to have very low or intermittent summer flows. The upper reach of Arrastra Fork also has limited fish distribution as a result of gradients above 16%. Fish habitat is present in Arrastra Fork for approximately the first mile upstream from where Arrastra Fork enters the mainstem of East Fork Mule Creek. Fish are also present in East Fork Mule Creek below this Planning Area. Channel roughness in the upper reaches of all streams within this HUC 6 sub-watershed is high. There are currently no water quality limited streams within the Mule Creek HUC 6 sub-watershed. However, stream surveys in Mule Creek indicate that sediment may be limiting aquatic productivity in some locations. Annual precipitation in this HUC 6 sub-watershed typically ranges between 90 and 118 inches.

3.2.2 Effects of Alternative 1 (No Action) on Soils and Water

Direct and Indirect Effects

Soil Productivity Loss and Erosion

There would be no change to current conditions within the Mule Creek HUC 6 sub-watershed as a result of the No Action Alternative.

Currently road densities are above levels at which watersheds are considered by NMFS to be properly functioning. However, many native surface roads within this watershed are blocked during the winter to reduce erosion. Due to block federal ownership, only about 20% of the roads in this HUC 6 sub-watershed are native surface. Many of these roads are ridgetop roads that have little or no hydrologic connection to streams, and thus contribute little if any sediment.

The temporary road that is proposed for reconstruction under the Proposed Action is one of the native surface roads that was blocked as a result of moderately high road densities within this HUC 6 sub-watershed. This temporary road was blocked and seeded approximately 16 years ago following its construction and use during the August Knob Timber Sale. No efforts were made at that time to reduce compaction on this roadbed, and though trees are currently growing on this site, soil compaction appears to have reduced their growth rates. Field visits showed tightly spaced whorls especially for the first 5-7 years, on trees growing along this roadbed. Additionally, trees growing along this roadbed are currently tightly spaced, and it would be expected that without thinning, these trees will become suppressed until natural or artificial thinning of this site occurs.

Most roads in this Planning Area have been recently maintained as a result of the Blossom Fire. Currently there is only one road that is known to have a drainage problem due to a plugged culvert which is resulting in increased sediment to Arrastra Fork Mule Creek. This road will be repaired this summer under Blossom Fire rehabilitation funds.

The Blossom Fire within this watershed burnt with mixed severity. In areas of low burn intensity it would be expected that the reduction in understory vegetation is improving stand productivity, and that erosion rates have generally returned to pre-burn conditions. On the approximately 200 acres within this sub-watershed where the fire severity was high to extreme, productivity would be expected to be reduced for 5-10 years due to the loss of organic material onsite, the volatilization of nutrients, and the reduced microbial activity within the soil (Barnett, 1989). These effects would be expected to diminish over time as these stands revegetate, and soil nutrients and microbial populations recover. On these high intensity burn sites, ground litter, understory vegetation, and overstory canopy closure losses have decreased evapotranspiration rates, increasing water availability and surface runoff, and reduced surface layer protection resulting in increased erosion rates. Areas where canopy closure is absence would also be experiencing increased erosion as a result of rainsplash detachment of soil particles, and surface runoff resulting from rain on snow events. In areas of moderate burn severity, soil nutrients and microbial activity would be expected to be reduced for 2-5 years, but to a lesser extent than in severely burnt areas. These effects would diminish more rapidly due to the lesser extent of the initial impact and the larger amount of remaining organic material onsite.

Approximately 9 miles of dozer firelines constructed during the Blossom Fire were rehabilitated through subsoiling, water-barring, placement of slash, and planting of conifers, which is greatly reducing the amount of surface erosion and compaction on these lines. However, even with rehabilitation measures such as the placement of logs for sediment capture, and the spreading of slash over exposed soils, hand built firelines which cleared vegetation for approximately 50-75 feet in width within the riparian zone of Mule Creek below this Planning Area, will continue to reduce localized water quality and aquatic habitat until vegetation reestablishes on these sites. Soil productivity on both dozer and hand built firelines will continue to improve over time as soil organisms and soil nutrients increase.

Though no projects are currently proposed, timber harvest is likely to occur within this watershed under other projects in the future. However, due to the federal block ownership in the Mule Creek HUC 6 sub-watershed, BMPs and PDFs established under the NWFP would be expected to minimize soil erosion and road building activities, and would protect riparian vegetation. Therefore most erosion associated with timber harvest would be expected to remain onsite, or become trapped within the riparian vegetation. Hydrologic connectivity of any new roads or yarding corridors would be minimal, and as a result little sediment would be expected to enter streams as a result of any potential future federal timber sales in this watershed.

Water Quality

Water quality would remain in fair condition under the No Action Alternative. Stream sedimentation resulting from erosion that occurs during existing road use, maintenance (including the plugged culvert mentioned above), and repair would continue to occur at current levels. High intensity burn areas on approximately 200 acres, and hand built firelines within the riparian area in this HUC 6 sub-watershed will continue to result in increased stream sedimentation and localized reductions in aquatic habitat until these sites revegetate. If future timber harvest activities occur within this watershed, BMPs and PDFs would minimize erosion. As a result these actions would not be expected to contribute enough sediment to streams to result in further reductions in aquatic habitat, or for Oregon Department of Water Quality (ODEQ) water quality standards for turbidity to be exceeded.

3.2.3 Effects of Alternative 2 (Proposed Action) on Soils and Water

Direct and Indirect Effects

Soil Productivity Loss and Erosion

The Proposed Action, including the reconstruction of a temporary access and haul road on the east side of unit 2, the building of one 0.2 acre landing, and the felling and extraction of timber within units 2 &3 and along the proposed roads and dozer cat lines, would result in approximately 2.0 acres of soil disturbance throughout the 70 acres in which activities within this proposed treatment area would occur. This would reduce soil productivity on no more than 1.0 acres of matrix land as a result of yarding corridors, the

construction of one landing, and one temporary road reconstruction along a previously planted roadbed. Upon completion of harvest activities in Units 2 and 3, prior to fall rains, the temporary landing and road would be subsoiled, waterbarred, mulched, and planted to minimize surface erosion. Since both the landing and road would be constructed on a ridgeline, it would not be expected that erosion from the construction, use, or decommissioning of either, would result in stream sedimentation. The HUC 6 basin downslope from this project totals approximately 19,600 acres. Approximately 0.4 acres of the productivity loss that would be caused primarily by soil compaction on the landing and temporary roadbed would be reduced by up to 80% as a result of subsoiling and planting (Andrus and Froehlich, 1983). Additionally, subsoiling, tree planting, and follow up brushing or thinning treatments that would occur along this existing roadbed (and within units 2 & 3) would be expected to result in a long-term (40+ years) improvement in the growth rates of trees on this site over existing conditions. It would be expected that, given the current conditions of the trees on this road, the size and health of the planted trees would meet or exceed that of those trees which are currently growing upon this compacted roadbed in the long-term. It would also be expected that productivity would be increased on several acres of ground within Units 2 and 3, as areas that currently consist of only dead trees would be replanted with young trees, and logging slash would be spread throughout the unit salvage units to provide soil protection and important source of soil nutrients that were lost during the Blossom Fire.

Therefore, given the scope of the project, and the improvements to productivity that would be made as a result of Alternative 2, the proposed action is anticipated to have a negligible impact to soil productivity and erosion rates at the watershed scale. Compaction would not exceed 12%, and productivity loss would not exceed 5%, within any one unit, or within the Planning Area as a result of this action. This would keep impacts from compaction and productivity within those levels assessed under the RMP.

Best Management Practices (BMPs) and Project Design Features (PDFs) would be used to minimize the amount of eroded material that occurs during the implementation of this alternative. Due to the increase in erosion that is presently occurring within this watershed as a result of the Blossom Fire, additional rehabilitation measures and PDFs were designed for Unit 2 under this alternative, to reduce erosion levels beyond those levels that would typically be expected to occur under the Medford RMP. For this project, Unit 2 has the greatest potential to result in stream sedimentation as a result of its close proximity to an intermittent headwater stream, the need for a landing and temporary road to be constructed in order to enable harvest, and the number of multiple use yarding corridors that would be created. Under Alternative 2, erosion would be minimized through standard BMPs such the requirement of partial suspension during all yarding operations to minimize soil displacement, seasonal restrictions to avoid excessive compaction that can occur on wet soils, and one site potential tree length (180ft) riparian buffers to reduce the hydrologic connectivity between upslope activities and the stream channel. In addition to these standard management practices, all yarding corridors would be rehabilitated by placing fines or mulch over exposed mineral soils, placement of logging slash over the multiple use yarding corridors, the construction of waterbars within yarding corridors as necessary to minimize surface water runoff within corridors,

and the placement of large slash material within the ephemeral draws on the west side of the unit to trap sediment prior to it reaching the intermittent stream below.

Since this project would primarily remove trees with less than 10% live canopies, there would be no increased surface erosion that could result with rain splash or rain on snow events due to open canopy conditions, beyond what is expected to occur under the No Action Alternative. The few green trees that would be removed would be to enable yarding operations (i.e. guyline trees) and for the construction of a portion of the 0.2 acre landing. The removal of these few scattered trees would not be expected to remove enough of the forest canopy to result in a measurable increase in surface erosion, over that which will occur naturally as a result of the Blossom Fire.

With the exception of one approximately 3-4 acre area within unit 2, where most the trees are dead and would be removed, trees that meet the 10% or less live crown criteria for removal, established under this project proposal, are scattered throughout the proposed treatment areas. As a result, the magnitude of ground disturbance caused by yarding would be greatly reduced because nearly every tree would be yarded along a different route, which would provide each individual tree with a fresh bed of ground litter upon which it would be yarded, in contrast to a typical multiple use corridor in which ground litter is displaced to varying degrees and bare mineral soil often results. It would be expected that where trees are disperse, such as along roads and dozerlines, and within most of Unit 3, there would be no ground disturbance that would result in measurable increases in erosion.

Within unit 2, in the approximately 3-4 acre area where a majority of the trees would be removed, a moderate increase in erosion, along the multiple use yarding corridors, would be expected. However, due to the soil characteristics, the modest amount of ground cover and organics that are still present within the riparian areas and the surrounding sideslopes in this proposed treatment area, and the additional PDFs that would be used to reduce the transport of eroded material, it would be expected that erosion from these activities would primarily remain on site and for the most part out of the stream below. Additionally by covering much of the currently exposed soils within Units 2 & 3 with slash material, this alternative would reduce the amount of surface erosion currently expected to occur as a result of the Blossom Fire. Replanting Units 2&3 would further help to stabilize soils by expediting the regrowth of vegetation. Any hazard trees that must be felled along roadways would be left on site to provide coarse woody, or large woody debris that would further reduce the transport of eroded material and stream sedimentation.

Road maintenance and haul activities would be expected to result in a minimal amount of erosion. These activities would be seasonally restricted to the dry season, and most roads were recently re-graded following the Blossom Fire reducing the need for road surfaces to be bladed and thus the amount of erosion that would occur. Where native surface or gravel roads that would be maintained and used for haul for this project are hydrologically connected to streams, they are not in close proximity to fish habitat.

Water Quality

Although a minimal amount of increased sediment would still be expected to enter streams as a result of this project due to upslope yarding corridor disturbance, eliminating direct routing mechanisms through BMPs and PDFs would allow upslope erosion to be filtered out within the soil rock fragments, ground litter, and riparian vegetation (where present). This would reduce the amount of sediment that enters the stream at any one time, and it would be expected that the minimal sediment that did make it to the stream would generally be transported during rain on snow, or severe rainstorm events, when flows are high. Because higher streamflows can carry more sediment and still remain in dynamic equilibrium, minimal amounts of sediment, such as would be expected under this project, typically become immeasurable above natural levels in terms of stream turbidity increases, stream sediment loads, or the amount of downstream sediment deposition.

Cumulative Effects to Soil and Water

Because ODEQ water quality standards and soil productivity standards under the RMP are at the project level, cumulative effects of these environmental elements have been analyzed at the HUC 6 sub-watershed scale. Analyzing elements of the environment, such as water quality, only at the HUC 5 scale would result in undetectable effects due to the larger flow capacities within the mainstem of a stream. As such, information at the HUC 5 scale would not provide the decision maker with the best available information to assist them in reaching a decision as to whether the effects of this project, when put in context with other activities within the Planning Area, would exceed ODEQ water quality, or Medford RMP soil productivity standards. ACS objectives, which are measured at the HUC 5 scale, must still be considered in order to ensure that this project won't cumulatively elevate effects that are occurring within this HUC 5 watershed to a level that would result in the degradation of aquatic and riparian habitat or species. However, if there are no detectable effects found to be occurring within the HUC 6 sub-watershed for this Planning Area, then there would also be no detectable effects from this project on aquatic species at the HUC 5 scale. Cumulative effects of this project are therefore a combination of these past and proposed direct and indirect effects, as well as the foreseeable effects of any other current or potential future, federal or non-federal projects within these three HUC6 sub-watersheds.

Soil Productivity Loss and Erosion

Within the Mule Creek HUC 6 sub-watershed, the only other project that could potentially result in altered soil productivity within this watershed are the Blossom Fire rehabilitation tree planting and maintenance brushing projects. The Blossom rehabilitation includes approximately 200 acres of planting, site preparation for these sites including the removal of dead vegetation, and brushing to reduce competition on these sites. These activities would be expected to slightly reduce erosion rates because sites proposed for planting are those which burned at high to extreme fire intensities and are therefore currently have only minimal soil stabilizing ground vegetation, and in many areas are exposed to rainsplash and other forms of surface erosion. Brushing of planted sites during Blossom rehabilitation would generally reduce the amount of vegetation

competing for soil nutrients and water, thus increasing site productivity and improving stand health.

Since productivity and erosion rates would not be negatively affected as a result of the Blossom rehabilitation and fuels reduction treatments, the cumulative effects to soil productivity and erosion within this sub-watershed is a combined total of past watershed disturbance combined with the effects of this project. Together, all projects within the Mule Creek HUC 6 sub-watershed would result in approximately 697 acres (3.6%) of ground that would be disturbed by past, present, and future timber harvest operations, roads, and dozerline fire breaks created during the Blossom Fire (Medford Change Detection, 1974-2002, field observations, and BLM past projects data). A total of 2.7% (538 ac) of Mule Creek HUC 6 sub-watershed would be estimated to be compacted as a result of past, present, and future, timber management activities, existing roads, and dozer firelines created during the Blossom Fire. Productivity loss from past present and future harvest, road construction, and the Blossom Fire within this sub-watershed is approximately 3.0%.

Water Quality

Water quality within this watershed would only be improved as a result of the Blossom rehabilitation and fuels reductions treatments which would reduce erosion. This project is the only project that is proposed within the Mule Creek HUC 6 sub-watershed in the foreseeable future. Therefore the cumulative effects to water quality, with the implementation of the Proposed Action, would be the same as those described under Direct and Indirect Effects for the Proposed Action.

3.3 Special Status Wildlife Species

3.3.1 Northern Spotted Owl (Threatened)

3.3.1.1 Affected Environment

The Proposed Action is almost entirely on the matrix land use allocation except for one mile in Section D (See Maps in appendix 6) that is within the LSR and RRs within the roadside treatments . One of the functions of matrix lands is to serve as connectivity between LSRs (USDA/USDI. 1994b, p. B-43). LSRs were established “to protect and enhance conditions of late-successional and old-growth forest ecosystems, and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth forest related species including the northern spotted owl” (Northwest Forest Plan, p. A-5).

There are four known historic spotted owl sites in the Mule Creek 6th field watershed: Mule West, Mule Creek, Far Out Mule and Mule East. They were first observed in 1988, 1989, 1992 and 1988 respectively, but have not been surveyed to protocol on an annual basis. The last known reproductive successes for these pairs occurred in 2002 for Mule West (the last year of surveys), 1999 (Mule Creek) and 1994 (Far Out Mule). Mule East

has never been known to nest successfully. These sites have designated 100 acre owl cores. The boundary of Mule West's 100 acre core is the closest (0.3 miles) to the southmost portion of the roadside units, although the actual nest site is approximately 0.8 miles away. The Planning Area has not been surveyed to protocol for owls.

Except for Unit 3, the proposed actions are located in stands which have largely been consumed by the Blossom Fire. The stands consist primarily of blackened second growth and some blackened mature or old growth trees. Scattered green trees remain within the proposed units, but the green canopies comprise less than 40 per cent canopy closure on 65 acres (58 acres along the five road segments and the 7 acres of Unit 2), and thus do not constitute suitable nesting/roosting/foraging or dispersal habitat for the spotted owl. In some locations along the roadside units, suitable nesting/roosting/foraging or dispersal spotted owl habitat is adjacent to the burned trees.

Northern spotted owl suitable habitat includes stands able to support nesting, roosting, and foraging. There are two categories of suitable habitat. Nesting/roosting/foraging habitat satisfies the daily and annual needs of the owl for nesting, roosting and foraging. These stands generally have a multilayered canopy with large trees in the overstory and an understory of shade tolerant conifers and hardwoods. Canopy closure generally exceeds 70%, and average DBH is generally 21 inches or greater. Also included in suitable habitat are conifer stands with understory vegetation or coarse woody debris which provide roosting and foraging opportunities but lack the necessary structure for consistent nesting. These stands have less diversity in the vertical structure and canopy closure generally exceeds 70% and average DBH is 11- 21 inches. Habitat 2 suitable habitat includes conifer stands with understory vegetation or coarse woody debris which provide roosting and foraging opportunities but lack the necessary structure for consistent nesting. These stands have less diversity in the vertical structure and canopy closure generally exceeds 70% and average DBH is 11- 21 inches. Units were either field-reviewed or analyzed using aerial photographs to determine if they met the definition of suitable habitat. Dispersal habitat (which does not also serve as suitable nesting/roosting/foraging habitat) are conifer-dominated stands with at least 40 per cent canopy closure and average dbh of 11".

The Bureau of Land Management (BLM), Forest Service (FS), and US Fish and Wildlife Service (USFWS) have conducted a coordinated review of four recently completed reports containing information on the NSO. The reviewed reports include the following:

- *Scientific Evaluation of the Status of the Northern Spotted Owl* (Sustainable Ecosystems Institute, Courtney et al. 2004);
- *Status and Trends in Demography of Northern Spotted Owls, 1985-2003* (Anthony et al. 2004);
- *Northern Spotted Owl Five Year Review: Summary and Evaluation* (USFWS, November 2004); and
- *Northwest Forest Plan – The First Ten Years (1994-2003): Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft* (Lint, Technical Coordinator, 2005).

Although the agencies anticipated a decline of NSO populations under land and resource management plans during the past decade, the reports identified more stationary populations in southern Oregon and northern California. The reports did not find a direct correlation between habitat conditions and changes in NSO populations, and they were inconclusive as to the cause of the declines. Lag effects from prior harvest of suitable habitat, competition with barred owls, and habitat loss due to wildfire were identified as current threats; West Nile virus and Sudden Oak Death were identified as potential new threats. Complex interactions are likely among the various factors. The status of the NSO population, and increased risk to NSO populations due to uncertainties surrounding barred owls and other factors, were reported as not sufficient to reclassify the species to endangered at that time

The effects on NSO populations identified in the four reports were within those anticipated in the RMP EIS, and that the RMP goals and objectives were still considered achievable in light of the information from the reports.

More transient effects to spotted owls that may be of concern include the effects of noise and smoke. The tendency of noise much above typical ambient levels to cause female birds to flush from nests during egg incubation or brooding of the young is well known and referred to as disturbance. This is the concern for noise from sources such as heavy equipment or chainsaws in locations where ambient noise is typically low.

In the area of the proposed treatment areas the usual human-caused noise level during the nesting season probably goes from none in early spring, while the snow restricts human access, to low levels in the summer, when recreational traffic on the Kelsey-Mule (BLM 32-8-31) road probably peaks. The Kelsey-Mule road is approximately ¼ mile from Units 2 and 3. Though this main road is adjacent to the old growth stand near Unit 2, wildlife would probably be habituated to the traffic noise coming from the north of the old growth stand, from outside the stands of unburned and burned trees that comprise the bulk of the action area, where there is little vehicular traffic.

3.3.1.2 Effects of Alternative 1 (No Action) on the spotted owl

Direct and Indirect Effects
Alternative 1 (No Action Alternative) would not be likely to cause any negative effects to the species. This is because the absence of such an action would not change the ability of the 6th field watershed to maintain spotted owls, to support their successful reproduction or to facilitate their dispersal.

3.3.1.3 Effects of Alternative 2 (Proposed Action) on the spotted owl

Direct and Indirect Effects
There is no nesting habitat for the species in the areas proposed for cutting, so there would be no direct effect to nesting owls within treatment areas. None of the sites proposed for harvest in the sale are suitable nesting/roosting/foraging because they lack

adequate canopy closure. Thus, the proposed action would not directly negatively affect spotted owls.

Because there would be chainsaw and heavy equipment work adjacent or close to potential nest stands, a seasonal restriction would be employed to avoid disturbance to nesting spotted owls. This seasonal restriction on operations, from March 1 to June 30th would be imposed on the use of chainsaws and heavy equipment, as per the PDCs of the 2006-2008 Biological Assessment (RORSISBLM FY 06-08 BA). These PDCs provide that the seasonal restriction may be waived by the local agency biologist; if, using surveys to protocol, it is determined the owls are not nesting that season. Likewise, the biologist has the option to extend the seasonal restriction based on site-specific knowledge of the nesting pair (e.g., for late, second nesting attempts).

Using the above PDC, there would not likely be any negative effect to the ability of spotted owls to successfully reproduce, because noise above the ambient levels would occur after any fledglings would likely have left the nest. While it is not likely there would be any negative effect to reproducing spotted owls, there is a very small possibility that a pair could nest much later than is usually the case, in the nearby unsurveyed, suitable habitat stands. There is also a very small possibility that the nest would be located in these stands within 195 feet of chainsaw work or 95 feet of heavy equipment work. Thus, there is an extremely small possibility that even with a seasonal restriction, nesting spotted owls could be adversely affected by noise from the operation. While there is a possibility of such an occurrence, the probability is extremely small.

In all units except Unit 3, the canopy closure is less than 40 per cent. In Unit 3 the canopy closure in some areas attains 40 per cent, but does not meet the minimum 60 per cent requirement to qualify as nesting/roosting/foraging habitat. As a stand with 40 per cent canopy closure (and trees over 11" dbh average), Unit 3 may be considered dispersal habitat, and would continue to meet those minimums after the dead and dying trees are removed in the Proposed Action (Note that all large down logs naturally found at the site would be retained, and any indirect benefit to spotted owls from that structural component would continue.) Therefore, no suitable nesting/roosting/foraging habitat would be downgraded, degraded or removed. And the one stand of dispersal habitat that would be entered (Unit 3) would continue to serve as dispersal habitat.

Spotted Owl Cumulative Effects

Other foreseeable actions are the Blossom Fire rehabilitation projects (analyzed under a separate environmental analysis), and approximately 290 acres of planting, potential cutting and piling of dead and live woody vegetation, burning these piles to facilitate planting, and to reduce competition on these sites.

The potential disturbance of smoke and noise from these actions would be mitigated by Project Design Criteria including seasonal restrictions for the spotted owl, as mandated by the PDCs in the current BA. The operations of both the salvage sale and these other projects are not expected to negatively affect the spotted owl.

Management on private lands does not currently provide substantial suitable habitat for spotted owls and this is not expected to change in the foreseeable future.

In summary, all of these actions have such a low level of influence on the species, that the August Knob Salvage project is not an action that would add incrementally to other actions in the 6th field watershed or the Section 7 watershed in the foreseeable future to likely negatively affect the spotted owl.

3.3.2 Marbled Murrelet (Threatened).

3.3.2.1 Affected Environment

The marbled murrelet is a small seabird (*Alcidae*) that nests along the Pacific coast from Alaska to central California, and winter as far south as Baja California, Mexico. Murrelets forage at sea, but nest on large limbs in old-growth coniferous forests, Murrelets require large trees with nesting platforms at least four inches in diameter, which are usually formed on large branches and may incorporate moss or debris piles. Murrelets are associated with late-successional and old-growth conifer forests for reproduction in this area (RORSISBLM FY 06-08 BA, p. 33). The BA goes on to state (p. 33, 34) that:

> Range-wide habitat loss is by far the greatest terrestrial threat to murrelets. Timber harvest has reduced the amount of old-growth forested habitat within western Oregon and Washington by greater than 80 percent and it is likely that disproportionate harvesting has occurred within the range of the murrelet compared with further inland forests (USDI Fish and Wildlife Service 1992b). The NWFP establishes all murrelet occupied stands on Federal lands as LSRs, which greatly restricts the habitat modification activities that can occur. In 1996, the USDI Fish and Wildlife Service (1996) designated murrelet critical habitat, which largely overlaps mapped LSRs within the murrelet range on Federal lands.
>
> Of primary concern in the Action Area [of the current programmatic consultation] is the potential for disturbance to breeding murrelets (In 1995, it was estimated that approximately 1,077 occupied murrelet sites occurred within Washington, Oregon, and California. In 1995, suitable habitat for the murrelet was estimated at 2,561,500 acres of Federal lands in the listed range of this species (Ralph et al. 1995.(BA, pp. 33-34)..
>
> In 1995, it was estimated that approximately 1,077 occupied murrelet sites occurred within Washington, Oregon, and California. In 1995, suitable habitat for the murrelet was estimated at 2,561,500 acres of Federal lands in the listed range of this species" (Ralph et al. 1995. *In* RORSISBLM FY 06-08 BA, p. 34).
>
> Survey data collected by the FS and BLM in southwestern Oregon (9,795 survey visits for murrelets between 1988 and 2001) indicate that murrelets inhabit

forested areas relatively close to the ocean. Approximately 82,400 acres of suitable habitat are located in Area A, which is the known range for the species in the Action Area (90 percent of the suitable habitat in Area A is in the NWFP LSRs and other reserved areas, and any stands of suitable habitat in Matrix subsequently found to be occupied are designated as additional 'Murrelet' LSR).

At this latitude Area A also corresponds to the Western hemlock (*Tsuga heterophylla*) Vegetation Zone. Area B is a 'buffer' to area A (RORSISBLM FY 06-08 BA, p. 34). Area B is approximately 10 km. wide and is further inland than Area A or. Note that Area A is the only physiographic region at this latitude, in which marbled murrelet nesting has been documented despite extensive surveys within Area B (Dillingham et al 1995). Area B is less likely to harbor nesting murrelets than Area A

No surveys for murrelets have been completed in the project area, which is entirely within Area B for marbled murrelets. No units, landing or proposed road reconstruction areas contain nesting habitat for the marbled murrelet. There are, however, mature stands adjacent or close to (within 360' of) several roadside unit sites, Unit 2 and the proposed landing site.

Concerns regarding potential disturbance for marbled murrelets is similar to that discussed for spotted owls. However, "for murrelets, the adverse effects of disturbance may also lead to nest abandonment by adults, reduced nest attentiveness (leading to increased vulnerability of predation), aborted feeding visits, premature fledging, and avoidance of otherwise suitable habitat (Hamer and Nelson 1998. *In* RORSISBLM FY 06-08 BA, p. 3).

3.3.2.2 Effects of Alternative 1 (No Action) on the Marbled Murrelet

Direct and Indirect Effects

The No Action Alternative would cause no beneficial nor adverse effects to marbled murrelets or their habitat because no action does not change the ability of the area to provide for the maintenance or reproduction of murrelets

3.3.2.3 Effects of Alternative 2 (Proposed Action) on the Marbled Murrelet

Direct and Indirect Effects

There is no nesting habitat for the species in the areas proposed for cutting, so there would be no direct effect to nesting murrelets in treatment areas. Because there would be a daily operating restriction on the proposed actions, there would not likely to be a negative effect of disturbance by noise to marbled murrelets that might be nesting in the old growth stand to the north of Unit 2 or close to the roadside units.

The stands in question are over 2 miles from the most inland point (at this latitude) of the physiographic zone in which murrelets have been observed. Thus, the probability of

marbled murrelets nesting in these stands is relatively low. Furthermore, considering their propensity to be secretive (RORSISBLM FY 06-08 BA), it is even less likely murrelets would use these partially burned stands or the outer portions of stands, where visual cover is poor. Therefore, the project wildlife biologist does not advise that the project follow the PDC in the BA that recommends delaying the project until after 15 September. Even without this PDC, there would not likely be a negative effect of disturbance by noise to nesting marbled murrelets, because of the very low likelihood that murrelets would nest within the sites disturbed by the noise of this project.

Cumulative Effects

Potential influences on marbled murrelets and their Critical Habitat include this salvage sale, the 1000 acres of fuels reduction treatments, the 200 acres of planting, the removal of dead vegetation and brush, and piling and burning for the Blossom Fire rehabilitation (mentioned above). Because the actions would not affect suitable habitat, and the potential disturbance of smoke and noise would be mitigated by Project Design Criteria, all these projects would be expected to not adversely affect the marbled murrelet.

Because the actions would not take place in suitable habitat and the projects would have no effect on the viability of that habitat, there would be no effect to the marbled murrelet. In summary, all of these actions have such a low level of influence on the species, that the August Knob Salvage project is not an action that would add incrementally to other actions in the 6th field watershed or the Section 7 watershed in the foreseeable future to likely negatively affect the marbled murrelet.

Because private lands are so limited in this area and their management in the foreseeable future is not expected to add to or detract from the ability of the area to contribute to the species' viability, the effects of management on these lands is not expected to affect the murrelet.

3.4 Mitigation Measure

This Mitigation Measure was developed in response to some specific public comments to allow the decision maker to evaluate the effects if those measures were taken. They differ from PDFs in that they are not restrictions but a subset decision point under any of the alternatives. Mitigation is defined as: *1/ avoiding the impact altogether by not taking a certain action or parts of an action; 2/ minimizing impacts by limiting the degree or magnitude of the action and its implementation; 3/ rectifying the impact by repairing, rehabilitating, or restoring the affected environment; 4/ reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and 5/ compensating for the impact by replacing or providing substitute resources or environments*.

3.4.1 Mitigation #1

Mitigation Measure #1 would be a decision point under the selected alternative. This Mitigation Measure would eliminate the construction of a new cable harvest landing approximately 0.2 acre in size. No green trees would be felled in creating the landing. Also approximately three acres of unit 2 would be deferred. Mitigation 1 was developed from one of the comments from KS Wild regarding opposition to new construction of roads.

Soil Productivity Loss and Erosion

Implementation of this mitigation measure would reduce the amount of disturbed soil by yarding corridors by approximately 0.2 acres. An additional 0.2 acres of soil would not be disturbed or compacted as a result of the temporary landing construction proposed under alternative 2. Reducing the amount of disturbed soils would also reduce the amount of material that would be prone to erosion by approximately 0.4 acres. Productivity losses from yarding corridors and the temporary landing construction would also be reduced under this mitigation measure, from approximately 1 acre to 0.8 acres.

Water Quality

The reduction in soil disturbance, compaction, and productivity loss, resulting from the implementation of this mitigation measure, would not cause a measurable change in this projects effect on water quality because the amount of sediment that would enter the intermittent stream under Alternative 2 is already expected to be immeasurable due to BMPs and PDFs.

Spotted Owl

The effects to spotted owls would be the same as without the mitigation measure. The trees removed in the area impacted by the Mitigation Measure do not meet the requirements of suitable nesting/roosting/foraging habitat for spotted owls, because canopy closure is very low (approximately 25 per cent).

Marbled Murrelet

There is no nesting habitat for the species in the areas proposed for cutting, so there would be no direct effect to nesting murrelets.

Chapter 4.0 List of Preparers

The following individuals participated on the interdisciplinary team or were consulted in the preparation of this EA:

Name	Title	Primary Responsibility
Marylou Schnoes	Wildlife Biologist	Wildlife, T/E Animals
Jim Brimble	Silviculturist	Silviculture
Jim Brown	Forester	Logging Systems
Chris Dent	Recreation Planner	Visual Quality, Recreation
Colleen Dulin	Hydrologist	Soils, Hydrology
Martin Lew	Ecosystem Planner	Team Leader, NEPA coordinator, Writer
Mike Main	Fuels Specialist	Fire Risk and Hazard, Air Quality
Stephanie Messerle	Fish Biologist	Essential Fish Habitat and Fisheries
Deston Russell	Civil Engineer Tech.	Transportation
Rachel Showalter	Botanist	Botany, Noxious Weeds, T/E Plants
Amy Sobiech	Archaeologist	Cultural Resources, Native American Coordinator
Terry Garner	Civil Engineer Tech.	Logging Systems

Chapter 5.0 Public Involvement and Consultation

5.1 Public Scoping and Notification

5.1.1 Public Scoping

The Glendale Resource Area accepts public comment of proposed forest management activities through the quarterly BLM Medford Messenger publication. A brief description of proposed projects, such as August Knob Salvage, a legal location and general vicinity map are provided along with a comment sheet for public responses. The August Knob Salvage was included in these quarterly publications beginning in winter, 2005. One letter of comment was received from Klamath Siskiyou Wildlands Center and responses to their comments are found under Appendix 3 of this EA.

5.1.2 30-day Public Comment Period

The Environmental Assessment will be made available for a 30-day public review period. Notification of the comment period will include: the publication of a legal notice in the Daily Courier, newspaper of Grants Pass, Oregon; and a letter to be mailed to those individuals, organizations, and agencies that have requested to be involved in the environmental planning and decision making processes for proposed timber sales. Comments received in the Glendale Resource Area Office, 2164 NE Spalding Ave. Grants Pass, Oregon 97526 on or before August 16, 2006 will be considered in making the final decision for this project.

5.2 Consultation

5.2.1 United States Fish and Wildlife Service

Informal or formal consultation under the Endangered Species Act, in accordance with regulations pursuant to Section 7 of the Endangered Species Act 1973, is currently being conducted through the 2006 – 2008 Biological Assessment (RORSISBLM FY06-08 Biological Assessment).

5.2.2 National Marine Fisheries Service

Consultation under the Endangered Species Act with NMFS would not be necessary as there would be No Effect to federally listed threatened Southern Oregon Northern California coho and coho critical habitat (Rogue Basin). There are no listed species within the portion of the Planning Area within the Rogue River Basin. The road maintenance and hauling activities which would occur within the Rogue Basin and the range of the federally threatened Southern Oregon Northern California coho salmon were determined to have no effect on coho or critical habitat.

No consultation as required under the Magnuson-Stevens Fishery Conservation and Management Act for adverse affects on Essential Fish Habitat as there is No Affect to EFH coho and chinook within the Rogue Basin and there is No Affect to coho and chinook within the Umpqua Basin.

5.2.3 State Historical Preservation Office

The State Historical Preservation Office approved the clearance/tracking form for the August Knob Salvage project. The form is contained within the August Knob Salvage Analysis file.

ACRONYMS AND GLOSSARY

Abbreviations:

BLM	Bureau of Land Management
BMP(s)	Best Management Practices
DBH	Diameter at Breast Height
ESA	Endangered Species Act
NEPA	National Environmental Policy Act
PDF	Project Design Feature

Air Quality. Refers to standards for various classes of land as designated by the Clean Air Act, P.L. 88-206, Jan. 1978.

Best Management Practices (BMP). Practices determined by the resource professional to be the most effective and practicable means of preventing or reducing the amount of water pollution generated by non-point sources; used to meet water quality goals (See Appendix D in RMP (USDI BLM 1995)).

Canopy. The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand.

Coarse Woody Debris. Portion of trees that have fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter.

Compaction (relative to this EIS). Refers to soil becoming consolidated by the effects of surface pressure often from heavy machinery or vehicle and pedestrian traffic.

Cover. Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Cultural Resources. The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, etc.) having scientific, prehistoric or social values.

Cumulative Effect. The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can also result from individually minor, but collectively significant actions taking place over a period of time.

Diameter at Breast Height (dbh). The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Direct attack is a method of fire suppression in which treatments are applied directly to burning fuel, such as wetting or smothering, in order to limit the amount of oxygen

available to the flame, or by constructing fireline for the purpose of removing available fuels (NWCG 2005).

Effects (or Impacts). Environmental consequences as a result of a Proposed Action. Effects provide the scientific and analytical basis for comparison of alternatives. Effects might be either direct (caused by the action and occur at the same time and place) or indirect (occurring later in time or at a different location, but are reasonably foreseeable or cumulative results of the action).

Effects and impacts as used in this EA are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic quality, historic, cultural, economic, social, or healthy effects, whether direct, indirect, or cumulative. Effects might also include those resulting from actions that might have both beneficial and detrimental effects, even if on the balance it appears that the effects would be beneficial.

Endangered Species. Any species defined through the Endangered Species Act of 1973 as amended, as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA). A statement of the environmental effects of a proposed action and alternatives to it. It is required for major federal actions under Section 102 of NEPA and is released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, CEQ guidelines, and directives of the agency responsible for the project proposal.

Erosion. Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is more rapid than normal, natural, or geologic erosion, primarily resulting from the activities of people, animals, or natural catastrophes.

Fire intensity is the rate of heat energy released during combustion per unit length of fire front, measured in British Thermal Units (Btu) per foot per second (NWCG 1994).

Fire return interval is the number of years between two successive fire events for a given area (NIFC-B, 2006).

Fire Severity

Low- Less than 75% of the dominant overstory vegetation is replaced
Mixed- Combination of Low and High severity in patches
High- More than 75% of the dominant overstory vegetation is replaced

Flame length is the distance measured from the tip of the flame to the middle of the flaming zone at the base of the fire. It is measured on a slant when the flames are tilted due to effects of wind and slope (NWCG, 1994).

Floodplain. The lowland and relatively flat area adjoining inland and coastal waters, including, at a minimum, areas that are subject to a one percent or greater chance of flooding in any given year.

Forage. All browse and non-woody plants that are available to livestock or game animals and used for grazing or harvested for feeding.

Forest canopy is defined as the stratum containing the crowns of the tallest vegetation present in the stand, usually above 20 feet in height (NWCG, 1994).

Forest Health. The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human caused stresses such as drought, insect attack, disease, climatic change, flood, resource management practices and resource demands.

Forb. Any herb other than grass.

Fuels. Combustible wildland vegetative materials present in the forest which potentially contribute to a significant fire hazard.

Fuel load is the measure of the amount of fuel in a given area, generally expressed in tons per acre (NWCG, 1994).

Fuels Management. Manipulation or reduction of fuels to meet Forest protection and management objectives while preserving and enhancing environmental quality.

Habitat Type. (Vegetative). An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Hardwoods. A conventional term for broadleaf trees and their wood products.

Hazard Tree. A tree that poses a danger to falling on roads used by humans.

Impacts. A spatial or temporal change in the environment caused by human activity**.** See effects.

Indirect Effects. Secondary effects which occur in locations other than the initial action or significantly later in time.

Intermittent Stream. Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Mitigation. Mitigation includes (1) avoiding the impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing,

rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (5) compensating for the impact by replacing or providing substitute resources or environments.

National Environmental Policy Act of 1969 (NEPA). This law requires the preparation of environmental impact statements for every major Federal Action which causes a significant effect on the quality of the human environment.

No-Action Alternative. The No-Action Alternative is required by regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The No-Action Alternative provides a baseline for estimating the effects of other alternatives. When a proposed activity is being evaluated, the No-Action Alternative discusses conditions under which current management direction would continue unchanged.

Non-attainment. Failure of a geographical area to attain or maintain compliance with ambient air quality standards.

Noxious Weeds. Rapidly spreading plants that can cause a variety of major ecological or economic impacts to both agriculture and wildland.

Overstory. That portion of trees which form the uppermost layer in a forest stand which consists of more than one distinct layer (canopy).

Perennial Streams. Streams that flow continuously throughout the year.

Prescription. Management practices selected and scheduled for application on a designated area to attain specific goals and objectives.

Rate of spread (ROS) is the speed at which the fire is advancing and is influenced by wind, slope, and the fuel type through which it is burning. ROS is usually measured in chains per hour (one chain equals 66 feet).

Resource Management Plan (RMP). A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act. (See USDI, BLM 1995).

Riparian Reserves. Designated riparian areas found outside Late-Successional reserves.

Reconstruction. replacing, rebuilding, or restoring an improvement facility or treatment (i.e., fence, spring development, cattle guard, road, trail, building, parking lot, etc.) to its original or modified condition.

Road Maintenance. The work required to keep a facility (road) in such a condition that it may be continuously utilized at its original or designed capacity and efficiency, and for its intended purposes.

Salvage. Harvesting of dead and dying stands or of scattered trees that result from disturbance such as fire**.**

Slash. The residue on the ground following felling and other silvicultural operations and/or accumulating there as a result of a storm, fire girdling, or poisoning of trees.

Snag. A standing dead tree usually without merchantable value for timber products, but having characteristics of benefit to cavity nesting wildlife species.

Soil Compaction. An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Stand. A community of trees or other vegetation uniform in composition, physiognomy, spatial arrangement, or condition to be distinguishable from adjacent communities.

Threatened Species. Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and which has been designated in the Federal Register as such. In addition, some states have declared certain species in their jurisdiction as threatened or endangered.

Understory. Vegetation (trees or shrubs) growing under the canopy formed by taller trees.

Water Quality. The chemical, physical and biological characteristics of water.

Watershed. Entire area that contributes water to a drainage system or stream.

Wildfire. Any wildfire not designated and managed as a prescribed fire with an approved prescription.

Yarding. The act or process of moving logs to a landing.

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APPENDIX 1 ALTERNATIVE DEVELOPMENT SUMMARY

Environmental Assessment Number OR-118-06-009

Pursuant to Section 102 (2) (E) of NEPA (National Environmental Policy Act of 1969, as amended), Federal agencies shall "Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." The CEQ (Council on Environmental Quality) regulations for implementing the procedural provisions of NEPA states, alternatives should be "reasonable" and "provide a clear basis for choice" (40 CFR 1502.14).

In light of the direction contained in both NEPA and the CEQ Regulations, the following questions were used to 1/ identify the alternatives to be analyzed in detail in this environmental assessment that are in addition to the "Proposed Action" and "No Action" alternatives, and 2/ document the rationale for eliminating alternatives from detailed study.

1. **Are there any unresolved conflicts concerning alternative uses of available resources?** *If yes, document and go to Question #2. If no, document rationale and stop evaluation*

   No. The following alternatives were considered but eliminated from further consideration**:**

   a) *KS Wild asked that the BLM consider an action alternative that does not call for salvage logging in Late Successional Reserves (LSRs.)*

   The BLM considered the removal of salvage trees in the August Knob EA and is not proposing salvage in LSRs. However, trees that pose a safety issue as being a risk of falling onto roads are proposed in the LSR and riparian reserves. As mentioned in the Proposed Action (section 1.3 of the August Knob EA) "[t]he only activity planned in the late successional reserve (LSR) and riparian reserve (RR) is felling hazard trees which would be left on site."

   b) *Please address and avoid the harmful impacts detailed in this study which is avoiding construction of new roads in roadless or sparsely roaded areas and of removal or restoration of existing roads.*

   There are no new permanent or temporary roads proposed for construction, however the Proposed Action would re-construct one road and decommission it after use. The August Knob interdisciplinary team analyzed salvage effects of reopening an existing skid road and determined that "[t]he temporary road that is proposed for reconstruction under the Proposed Action is one of the native surface roads that was blocked as a result of moderately high road densities within this HUC 6 sub-watershed. This temporary road was blocked and seeded approximately 16 years ago following its construction and use during the August

Knob Timber Sale. No efforts were made at that time to reduce compaction on this roadbed, and though trees are currently growing on this site, soil compaction appears to have reduced their growth rates. Field visits showed tightly spaced whorls especially for the first 5-7 years, on trees growing along this roadbed. Additionally, trees growing along this roadbed are currently tightly spaced, and it would be expected that without thinning, these trees will become suppressed until natural or artificial thinning of this site occurs" (EA, section 3.2.2). Re-opening this road and decommissioning after use would not have any negative effects to the existing road grade. In the future this road grade could be re-opened to allow access for other forest management activities without constructing another road access.

The IDT considered an alternative to helicopter log units 2 and 3. This alternative was dropped from further consideration as it was not economical due to the high costs associated with helicopter logging that would not be offset by the anticipated volume from salvage logging 12 acres. If the alternative had been analyzed in detail the effects of such an alternative would be similar to the No Action Alternative.

Helicopter yarding is used instead of tractor or cable yarding methods for such reasons as limited access due the high cost of building roads or risk of sedimentation from mid-slope road building. The Purpose and Need of the project states that this project would recover "mortality volume that would otherwise be lost to decay… and silvicultural systems that are economically feasible." The costs for helicopter logging are much higher than conventional harvesting systems. The appraisal costs for helicopter yarding with the Boeing BV-234 is $5,400 an hour with a consumption of 405 gallons of jet fuel an hour. Though not precise, a rule of thumb is that approximately 500,000 to 1,000,000 board feet of timber to be yarded with helicopter is a minimum threshold for an operator to consider economically viable because of move-in costs. A heavy helicopter such as a Boeing BV-234 can lift up to 10,000 pounds and would be needed for trees with over 1000 pounds (greater than 24 inches DBH). Move in costs would be approximately $10,000 per ship.

As an example, the appraisal cost of helicopter yarding came out to $302/mbf compared the cost for cable yarding system of $139/mbf on the Willy Slide Timber Sale.

2. **What alternatives should be considered that would lessen or eliminate the "unresolved conflicts concerning alternative uses of available resources"?** *List alternatives and go to Question #3. If no alternative is identified other than the "no action" alternative, document and stop evaluation.*

   There are no unresolved conflicts and therefore no alternatives considered.

3. **Of those alternatives identified in Question #2, are there reasonable alternatives for wholly or partially satisfying the need for the Proposed Action?** *If so, briefly describe alternatives and go to question #4. If no, document rationale and stop evaluation.*

   There were no alternatives identified in Question #2

4. **Of those alternatives identified in Question #3, will such alternatives have meaningful differences in environmental effects?** *If so, seek line officer approval to carry alternatives forward for detailed analysis in the environmental assessment. If no, document rationale and stop evaluation.*

   There were no alternatives identified in Question #3

APPENDIX 2 ENVIRONMENTAL ELEMENTS

Environmental Assessment Number OR-118-06-009

In accordance with law, regulation, executive order and policy, the interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter 2 of the EA (environmental assessment). The following three tables summarize the results of that review. Those elements that are determined to be "affected" will define the scope of environmental concern, Chapter 3 of the EA.

Table 1. Critical Elements of the Environment. This table lists the critical elements of the human environment (BLM Handbook 1790-1) which are subject to requirements specified in statute, regulation, or executive order and the interdisciplinary teams predicted environmental impact per element if the alternative described in Chapter 2 of the environmental assessment was implemented.

Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
Air Quality (Clean Air Act)	Not Affected	The Planning Area is not located within a Class I designated airshed or non-attainment area. Dust created from vehicle traffic on gravel or natural-surfaced roads, road reconstruction and logging operations would be localized and of short duration. Activity fuels would be lopped and scattered, and no burning of slash will occur. Therefore the Proposed Action is compliant with the Clear Air Act .
Areas of Critical Environmental Concern	Not Present	There are no Areas of Critical Environmental Concern located within the Planning Area.
Cultural, Historic, Paleontological	Not Affected	Cultural resource surveys were completed for the project in May 2006. Cultural sites are any location that includes prehistoric and/or historic evidence of human use or that has important sociocultural value. No sites were found and as such, cultural resources would not be affected. If cultural resources are located during the implementation of an action, the project would be redesigned to protect the values present or until an evaluation can occur based on recommendations from the Glendale Resource Area archaeologist with concurrence from the State Historic Preservation Office. All such sites would be evaluated and protected by the BLM under the following Federal laws: Federal Land Policy and Management Act of 1976, National Historic Preservation Act (Section 106) of 1966, Antiquities Act of 1906, Archaeological Resource Protection Act of 1979, Reservoir Salvage Act of 1960, American Indian Religious Freedom Act of 1978, National Environmental Policy Act of 1960, and Native American Graves Protection and Repatriation Act of 1990.
Energy (Executive Order 13212)	Not Affected	The Proposed Action will have no effect on energy development, production, supply and/or distribution

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Environmental Justice (Executive Order 12898)	Not Affected	The Proposed Action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Prime or Unique Farm Lands	Not Present	There are no prime or unique farmlands within the Planning Area.
Flood Plains (Executive Order 11988)	Not Affected	The Proposed Action does not involve occupancy and modification of floodplains, and will not increase the risk of flood loss. As such, the Proposed Action is consistent with Executive Order 11988.
Hazardous or Solid Wastes	Not Affected	There would be no environmental effects associated with this element due to the implementation of the Best Management Practices contained in the Medford RMP and the terms/conditions of the timber sale contract.
Invasive, Nonnative Species (Executive Order 13112)	Not Affected	Map 18 of the *Wild Rogue North Watershed Analysis* (WA), October, 1999 does not identify any known noxious weeds within the proposed project area. However, the WA does identify that noxious weeds are located along some roads within the HUC 5. During project implementation, increased vehicle traffic could increase or at least perpetuate along road systems because of seed dispersal. In an effort to address the potential for project activities to increase the rate of spread of noxious weeds, Project Design Features (PDFs) have been included in the project design to decrease the potential for weed expansion associated with the Proposed Action. PDFs include washing equipment prior to moving it on-site, operating vehicles/equipment in the dry seasons and seeding and/or planting with native vegetation to reduce the potential establishment of noxious weeds. These PDFs are widely accepted and utilized as Best Management Practices (BMPs) in noxious weed control strategies across the nation (Thompson, 2006). Implementing the PDFs that reduce the potential for noxious weed expansion is expected to result in similar potential expansion associated with the No Action Alternative (Alternative 1). Surveys for noxious weed populations within August Knob units are currently underway in accordance with the WA recommendation (p. 146) to update the noxious weed inventory. A Supplemental Information Report to document the result of the new inventory will be prepared and available for public review, and will be considered by the Glendale Field Manager in reaching a final decision on the August Knob Salvage project.
Native American Religious Concerns	Not Affected	

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T/E (Threatened or Endangered) Fish Species or Habitat	Not Affected: Southern Oregon Northern California coho and coho critical habitat within the Rogue Basin	Salmon are listed under the Endangered Species Act by ESUs. An ESU is a stock of Pacific salmon that is 1) substantially reproductively isolated from other conspecific populations units; and 2) represents an important component in the evolutionary legacy of the species. The northern most extent of the federally listed threatened Southern Oregon/Northern California (SONC) coho salmon ESU is just north of the Rogue River Basin. <u>Not Affected: Federally listed threatened Southern Oregon Northern California coho and coho critical habitat (Rogue Basin).</u> The Proposed Action would have no effect on Southern Oregon/Northern California coho or coho critical habitat (CCH). *Roadside and dozer line hazard and salvage tree removal* - The closest roadside hazard tree removal (including the salvage on the dozer lines) to CCH is approximately 0.6 miles from CCH in Arrastra Creek. The dozer lines are located on ridges and are not hydrologically connected. The hazard and salvage trees to be removed are sparsely located along the roads and dozer lines. Disturbance would likely be minimal because of the PDFs and the small number of trees to be removed. Hazard trees identified within riparian reserves would be felled and left on site therefore no ground disturbance would result within riparian reserves. Because of the lack of ground disturbance within riparian reserves, the PDFs, and the small number of hazard and salvage trees to be removed outside of riparian reserves sediment would not reach CCH. There are a small number of dead trees which could be considered hazard trees within riparian reserves.

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T/E (Threatened or Endangered) Fish Species or Habitat (continued)	Not Affected: Southern Oregon Northern California coho and coho critical habitat within the Rogue Basin	The few which could be felled would not result in a reduction of shade or an increase in temperature in tributaries to CCH because of the minimal amount of trees which could be removed and by removing those few trees, shade would not be reduced. In conclusion, neither coho nor CCH would be affected from the roadside or dozer lines salvage or hazard tree removal because 1) temperature and shade would not be affected, 2) sediment would not reach CCH, and 3) recruitment of LWD would not be effected to the extent which would affect stream processes. *Salvage Unit 2* – Unit 2 is located approximately 2.1 miles from CCH in Arrastra Creek. Unit 2 has one intermittent stream located along the edge of the unit. A full riparian reserve buffer would be applied, with no treatment occurring within the riparian reserve. Because of the full riparian reserve buffer temperature, shade, and LWD recruitment would not be affected within the intermittent stream or CCH in Arrastra Creek. Any sediment entering the intermittent stream as a result of yarding operations in unit 2 would not result in a change of habitat where CCH or coho are located in Arrastra Creek because of the distance (2.1 miles) of CCH downstream from the unit, the PDFs, and the minimal amount of sediment which could reach the intermittent stream. Coho behavior and food sources such as macroinvertebrates would not be affected from sediment entering the intermittent stream. In conclusion, neither coho nor CCH would be affected because 1) temperature, shade and LWD recruitment would not be affected and 2) any sediment input to the intermittent stream would not affect CCH, coho behavior, or food sources. *Salvage Unit 3* - Unit 3 is located approximately 1.3 mile from CCH in Mule Creek. There are no riparian reserves located within unit 3 so shade, temperature, and future LWD recruitment would not be affected . No mechanisms for sediment to be delivered to CCH in Mule Creek from the proposed actions in Unit 3 exist. Coho or CCH would not be affected from the proposed actions in unit 3 because 1) sediment would not be delivered to CCH and 2) shade, temperature and future LWD would not be affected.

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T/E (Threatened or Endangered) Fish Species or Habitat (continued)	Not Affected: Southern Oregon Northern California coho and coho critical habitat within the Rogue Basin	Haul - The haul associated with the proposed hazard and salvage tree removal would not cause sediment to reach CCH. The closest stream crossing on a gravel or natural surface haul road to CCH is approximately 0.6 miles to Arrastra Creek. Factors which would eliminate sediment from reaching CCH from the natural surface and gravel roads include 1) the proximity of stream crossings to CCH and 2) PDFs restricting wet season hauling. Roads 31-9-35, 32-8-1.1 and 33-7-2 parallel Walker Creek, West Fork Cow Creek and Cow Creek respectively. Walker Creek, West Fork Cow Creek and Cow Creek are within the Umpqua Basin. SONC coho are not present within the Umpqua Basin. Coho within the Umpqua Basin belong to a different ESU, the Oregon Coastal coho. Oregon Coastal coho are not listed under the Endangered Species Act. Road Maintenance – The only road maintenance which would occur under this EA would be along the roads proposed for roadside hazard and salvage. The closest stream crossing on a road which would have maintenance is approximately 0.6 miles to CCH in Arrastra Creek. Because trees would not be removed within riparian reserves ground disturbance would not occur on roads within riparian reserves. Therefore roads within riparian reserves would not need maintenance on the road surface or prism such as grading or blading the ditch line. Outside of riparian reserves the road maintenance which would occur would not result in sediment reaching CCH in Arrastra Creek because 1) the proximity of stream crossings to CCH and 2) no maintenance occurring within riparian reserves. A culvert along road 32-9-26 currently is blocked and the stream is flowing across the road. This culvert would be replaced prior to the hauling associated with this project. The culvert replacement would be funded from the Blossom Fire Emergency Stabilization and Rehabilitation Plan and is covered under the District Programmatic Road and Recreation Site Maintenance CE.
T/E (Threatened or Endangered) Plant Species or Habitat	Not Present	Of the four federally listed plants on the Medford District (*Fritillaria gentneri*, *Limnanthes flocossa* ssp. *grandiflora*, *Arabis macdonaldiana*, and *Lomatium cookii*, only *Fritillaria gentneri* has a range and habitat which extends into the Glendale Resource Area. However, the August Knob Planning Area is not within range and habitat of *F. gentneri*, as determined by the US Fish and Wildlife Service.

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T/E (Threatened or Endangered) Wildlife Species, Habitat and/or Designated Critical Habitat	Northern Spotted Owl (NSO) Affected NSO critical habitat Not Affected Bald Eagle Not Present MAMU Affected Marbled Murrelet CHU Not Affected	NSO, affected: Suitable spotted owl nesting habitat is within 195 feet of Units 2, 3 and some sites in the roadside salvage. Seasonal restrictions for actions that would disturb this species would constrain operations and prevent likely disturbance. The proposed action, which includes a seasonal restriction from March 1 to June 30 for chainsaw work within 195 feet or heavy equipment use within 95 feet of spotted owl nesting habitat, would likely prevent negative effects. Units, landings and yarding corridors contain no suitable NRF for spotted owls. Only Unit 3 has an area that may serve as dispersal habitat and would continue to do so following harvest. NSO critical habitat, not affected: The proposed action is within spotted owl critical habitat, but there is no suitable habitat in the units, the landing or the road reconstruction sites. Therefore, there are no effects to suitable spotted owl habitat. Bald eagle, not present: Bald eagles are known to occur along the Rogue River, nesting and roosting habitat for which is over 4 miles from the proposed action Marbled murrelets, affected: There would not likely be an adverse effect of disturbance by noise to marbled murrelets that might be nesting in the old growth stand to the north of Unit 2 or close to the roadside units. Project design features impose seasonal and daily restrictions for actions that would disturb these species during the nesting seasons. Therefore, there would not lilkely be a negative effect from the operations on nesting marbled murrelets in nearby stands. The proposed action is in Area B, the zone within 10 km of the historical known range of the species. Marbled murrelets have not been documented in Area B, but Project Design Criteria (PDCs)contained in current consultation with the US Fish and Wildlife Service mandate that no chainsaw or heavy equipment work would take place within 360 feet of unsurveyed suitable marbled murrelet nesting habitat between April 1 an August 5. Furthermore, between August 6 and September 30, all heavy equipment work and chainsaw activities within 360 feet of potential (unsurveyed) nesting habitat would not take place during the 2 hours after dawn and 2 hours before sunset, to avoid disturbance to nesting murrelets. Marbled murrelet CHU, not affected: Approximately one mile of roadside hazard tree removal is within designated Critical Habitat for the marbled murrelet. However, because of low canopy there is no nesting habitat for murrelets within the proposed treatments areas.

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Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
T/E (Threatened or Endangered) Wildlife Species, Habitat and/or Designated Critical Habitat (continued)	Not Affected Fisher.	Fisher (Candidate Species), Not Affected: Abundant numbers of snags and large down wood (more than twice the amounts called for on the NFP or RMP) would remain following harvest in the immediate vicinity of the proposed units. Thus, the ability of the area to retain and recruit adequate dead wood for future fisher habitat within the vicinity of the Planning Area would not be impaired. Units currently do not contain adequate cover for the species.
Water Quality (Surface and Ground)	Not Affected: Temperature & Chemical/Nutrient Contamination Affected Sediment/ Turbidity	This action does not involve the manipulation or removal of any riparian vegetation, except the felling of any hazard trees to be left on site, and as such would not affect stream temperatures or the recruitment and development of LWD. There are no fish streams within or adjacent to proposed treatment area, thus full Northwest Forest Plan riparian reserve buffers of a distance equal to 1 potential tree height have been designated on all streams within this Planning Area. These riparian reserves act to maintain existing shade conditions, protect trees that may develop into LWD, and to eliminate any riparian ground disturbance that could result in this project creating an unnatural sediment routing mechanism that would allow upslope sediment to directly enter waterways. Under certain conditions fire can alter nutrient levels within the soil in the short term. The Blossom Fire burnt approximately 11,800 acres within the Mule Creek HUC 6 sub-watershed, however only about 200 of these acres burnt at a high enough intensity to consume patches of understory vegetation and kill overstory trees. Within this Planning Area, most acres burnt at a low to moderate intensity, with only a few isolated pockets, generally less than 1-2 acres in size, burning hot enough to kill all vegetation. Outside these few pockets, areas that burnt at low to moderate intensity still have considerable live vegetation and trees onsite that are helping to keep soils within these areas productive for native species. As a result, most eroded material from this project would be expected to stay onsite, and organics, course wood, and most live vegetation would remain within all project units. Therefore it would not be expected that any measurable levels of chemical or nutrient contamination of streams would occur as a result of this project. Of the water quality elements, only sedimentation and turbidity would be expected to be affected under this project. Sources of erosion, and potential ensuing stream sedimentation, are further discussed in chapter 3 under Soils and Water Quality. Oregon water quality standards for turbidity would not be exceeded.

Table 1. Critical Elements of the Environment. This table lists the critical elements of the human environment (BLM Handbook 1790-1) which are subject to requirements specified in statute, regulation, or executive order and the interdisciplinary teams predicted environmental impact per element if the alternative described in Chapter 2 of the environmental assessment was implemented.

Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
Wetlands (Executive Order 11990)	Not Affected	There are no known wetlands within this Planning Area. Therefore the proposed action will not result in the destruction, loss or degradation of any wetland. As such, the proposed action is consistent with Executive Order 11990
Wild and Scenic Rivers	Not Present	The Rogue River, designated as a Wild and Scenic River, is located approximately 6 miles downstream from the Planning Area. Because of the distance away, the scale of the proposed action and the PDFs none of the proposed activities would have any effect on the Outstandingly Remarkable Values (ORV) of the Rogue Wild and Scenic River (scenery, fisheries, water-based recreation).
Wilderness	Not Present	No designated wilderness is within the Planning Area. Proposed activities are not directly adjacent to the Wild Rogue Wilderness Area

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary teams predicted environmental impact per element if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Essential Fish Habitat for coho and chinook salmon within the Rogue Basin	Not Affected: EFH within the Rogue Basin	Some streams within this Planning Area are designated as EFH (Essential Fish Habitat) under the Magnuson-Stevens Fishery Conservation and Management Act. <u>Not Affected: EFH for coho and chinook within the Rogue Basin</u>. The Proposed Action would have no effect on EFH for coho or chinook salmon in the Rogue River basin. *Roadside and dozer line hazard and salvage tree removal* - The closest roadside hazard tree removal (including the salvage on the dozer lines) to EFH is approximately 0.6 miles from EFH in Arrastra Creek. The dozer lines are located on ridges and are not hydrologically connected to EFH. The hazard and salvage trees to be removed are sparsely located along the roads and dozer lines. Disturbance would likely be minimal because of the PDFs and the small number of trees to be removed. Hazard trees identified within riparian reserves would be felled and left on site therefore no ground disturbance would result within riparian reserves. Because of the lack of ground disturbance within riparian reserves, the PDFs, and the small number of hazard and salvage trees to be removed outside of riparian reserves sediment would not reach EFH. There are a small number of dead trees which could be considered hazard trees within riparian reserves. The few which could be felled would not result in a reduction of shade or an increase in temperature in tributaries to EFH. The loss of future recruitment of LWD would be so small it would not affect current or future stream processes in EFH or tributaries to EFH. In conclusion, EFH would not be affected from the roadside or dozer lines salvage or hazard tree removal because 1) temperature and shade would not be affected, 2) sediment would not reach EFH, and 3) recruitment of LWD would not be effected to the extent which would affect stream processes. *Salvage Unit 2* – Unit 2 is located approximately 2.1 miles from EFH in Arrastra Creek. Unit 2 has one intermittent stream located along the edge of the unit. A full riparian reserve buffer would be applied, with no treatment occurring within the riparian reserve. Because of the full riparian reserve buffer temperature, shade, and LWD recruitment would not be affected within the intermittent stream or EFH in Arrastra Creek. Any sediment entering the intermittent stream as a result of yarding operations in unit 2 would not result in a change of habitat where EFH is located in Arrastra Creek because of the distance (2.1 miles) of EFH downstream from the unit, the PDFs, and the minimal amount of sediment which could reach the intermittent stream. In conclusion, EFH would be affected because 1) temperature, shade and LWD recruitment would not be affected and 2) any sediment input to the intermittent stream would not affect EFH.

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Essential Fish Habitat for coho and Chinook salmon within the Umpqua Basin	Not Affected: EFH within the Umpqua Basin	*Salvage Unit 3* - Unit 3 is located approximately 1.3 mile from EFH in Mule Creek. There are no riparian reserves located within unit 3 so shade, temperature, and future LWD recruitment would not be affected. No mechanisms for sediment to be delivered to EFH in Mule Creek from the proposed actions in Unit 3 exist. EFH would not be affected from the proposed actions in unit 3 because 1) sediment would not be delivered to EFH and 2) shade, temperature and future LWD would not be affected. *Road Maintenance* – The only road maintenance which would occur under this project would be along the roads proposed for roadside hazard and salvage. The closest stream crossing on a road which would have maintenance is approximately 0.6 miles to CCH in Arrastra Creek. Because trees would not be removed within riparian reserves ground disturbance would not occur on roads within riparian reserves. Therefore roads within riparian reserves would not need maintenance on the road surface or prism such as grading or blading the ditch line. Outside of riparian reserves the road maintenance which would occur would not result in sediment reaching CCH in Arrastra Creek because 1) the proximity of stream crossings to CCH and 2) no maintenance occurring within riparian reserves. . *Haul* - The haul associated with the proposed hazard and salvage tree removal would not cause sediment to reach CCH. The closest stream crossing on a gravel or natural surface haul road to CCH is approximately 0.6 miles to Arrastra Creek. Factors which would eliminate sediment from reaching CCH from the natural surface and gravel roads include 1) the proximity of stream crossings to CCH and 2) PDFs restricting wet season hauling. <u>Not Affected: EFH for coho and chinook within the Umpqua Basin</u>. *Haul* – The only proposed action which would occur within the Umpqua Basin is hauling. Hauling within the Umpqua Basin would occur on roads 31-9-35, 32-8-1.1 and 33-7-2 which parallel Walker Creek, West Fork Cow Creek and Cow Creek respectively. EFH is present in Walker Creek, West Fork Cow Creek, Cow Creek and some tributaries of these streams. These roads are bituminous surface treatment (BST). This type of road surface, similar to a paved road, does not have surface erosion from hauling. There are no mechanisms for sediment to be transported from hauling on roads 32-8-1.1 and 33-7-2 to EFH in West Fork Cow Creek, Cow Creek or their tributaries.

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Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Fire Hazard/Risk	Not Affected	***Fire hazard*** is the ability of a fire to spread once ignition has occurred (NIFC-B, 2006). It is contingent upon the fire behavior that a stand has the potential to produce. Fire behavior dictates which fire suppression strategy may be effectively employed, and therefore the extent to which a fire may grow and the subsequent damage it may cause. Because fire behavior is critical in fire suppression strategy selection, it serves as the threshold used for environmental analysis. The unit of measure of the threshold is considered in terms of flame length. Flame lengths under 4 feet can generally be effectively managed by fire suppression personnel, such as hand crews, using the direct attack method. Flame lengths greater than 4 feet generally require specialized equipment and indirect attack methods which are inherently more expensive and dangerous due to their complexity (Rothermel, 1982). The current condition of the stands proposed for treatments resemble Timber-Litter fuel model TL1. The amount of slash created by the proposed harvest activities may transition the stands to a Slash-Blowdown fuel model SB1. Neither of these fuel models produce flame lengths that compromise the 4 foot flame length threshold for direct attack, therefore there is no increase in fire hazard due to the presence of activity slash. Once the stands are planted, they are expected to transition from fuel model SB1 to Shrub fuel models SH2 and SH4 as the plantations mature in 10 years. The flame lengths produced by fuel model SH4 have the potential to reach 8 feet, exceeding the 4 foot threshold for direct attack. However, the plantations are managed stands and are expected to be maintained by brushing and thinning, which will impede future accumulations of vegetation and decrease fire hazard. Conversely, under the no action alternative, the stands are expected to revegetate naturally with brush and other vegetation with no maintenance expected. This may result in a Shrub fuel model SH9 with the potential to produce flame lengths of 12-25 feet, far exceeding the 4-8 feet of the managed plantations. Because natural revegetation of these stands under the No Action Alternative produces a dramatically increased fire hazard in terms of flame length than the proposed managed plantations, fire hazard is considered to be not affected by the Proposed Alternative. Fire Risk is the probability of a fire starting, as determined by the presence of ignition sources. Ignition sources include natural causes such as lightning, and human causes such as burning garbage and debris piles escaping control, improperly disposed of cigarette butts, and unattended camp fires. Fire risk generally increases as human presence increases because these types of activities become more frequent. New road construction potentially allows for increased human activity and therefore increase fire risk. This project proposes no new road construction and is not expected to increase human presence, therefore the existing fire risk is considered to be not affected by the Proposed Action.

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Other Elements of the Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
Recreation	Not Affected	There are no developed BLM recreation sites on public lands in the Planning Area. A field survey found no indication of dispersed recreation activities occurring within the Planning Area (hunting camps, user trails, ohv use, etc.).
Rural Interface Areas	Not Present	There are no rural interface areas within the Planning Area.
Special Areas (not including ACEC)	Not Present	There are no designated Special Areas such as Resource Natural Areas, or Adaptive Management Areas, within the Planning Area.
Survey & Manage and Special Status Species (not including T/E): Fish Species/Habitat	Not Present Survey & Manage Fish Species Not Affected: Southern Oregon Coast/California Coast fall and spring chinook (Rogue) Not Affected: Klamath Mountain Province Summer and Winter Steelhead (Rogue) No management requirement: Pacific lamprey and Southern Oregon/Northern California coastal cutthroat trout (Rogue)	There are no Survey and Manage fish species listed in the *Final Supplemental Environmental Impact Statement and Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and* Guidelines (FSEIS, 2000 and ROD, 2001) including any amendments or modifications in effect as of March 21, 2004. Fish species are listed as special status species by ESUs. Not Affected: Bureau Sensitive Southern Oregon Coast California fall chinook and Bureau Assessment Southern Oregon Coast Spring chinook within the Rogue Basin. *Roadside and dozer line hazard and salvage tree removal, Salvage Unit 2, Salvage Unit 3, Road Maintenance, and Haul* - Fall Chinook use the first 0.5 mile of Mule Creek. Spring Chinook, a Bureau Assessment species, do not use Mule Creek but are present within the Rogue River. The proximity of the proposed actions to fall and spring chinook is approximately 5.5 miles and 6 miles respectively. Because of the distance away, the scale of the proposed action and the PDFs none of the proposed activities are anticipated to have any effect on fall or spring chinook or their habitat Not Affected: Bureau Assessment Klamath Mountain Province (KMP) summer and winter steelhead within the Rogue Basin. *Roadside and dozer line hazard and salvage tree removal, Salvage Unit 2, Salvage Unit 3, Road Maintenance, and Haul* - The habitat and distribution of KMP steelhead over laps EFH and CCH within Arrastra Creek and Mule Creek. Habitat requirements for EFH, CCH and steelhead habitat are very similar. Because there were no effects expected to occur to EFH or CCH and habitat requirements are similar for EFH, CCH and steelhead habitat, no effects from the proposed action to KMP steelhead are anticipated. No management requirement: Bureau tracking Pacific lamprey and Southern Oregon/California coastal cutthroat trout within the Rogue Basin. Bureau Tracking species are not considered special status species for management purposes. These species do not require management or mitigation (IM OR-2003-054).

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Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Survey & Manage and Special Status Species (not including T/E): Fish Species/Habitat	Not Affected: Oregon Coast summer and winter steelhead (Umpqua) Not Affected: Oregon coast coho (Umpqua)	Not Affected: Bureau Sensitive Oregon Coast winter steelhead and Bureau Sensitive Oregon coast coho within the Umpqua Basin. *Haul* - The only proposed action which would occur within the Umpqua Basin is hauling. Hauling would occur on roads 31-9-35, 32-8-1.1 and 33-7-2 which parallel Walker Creek, West Fork Cow Creek and Cow Creek respectively. Winter steelhead and coho are present in Walker Creek, West Fork Cow Creek, Cow Creek and some of their tributaries. These roads are bituminous surface treatment (BST). This type of road surface, similar to a paved road, does not have surface erosion from hauling. There are no mechanisms for sediment to be transported from hauling on roads 31-9-35, 32-8-1.1 and 33-7-2 to Oregon Coast winter steelhead and coho in Walker Creek, West Fork Cow Creek, Cow Creek, or their tributaries. No Management Requirement: Oregon coastal cutthroat trout and Pacific lamprey within the Umpqua Basin. Bureau Tracking species are not considered special status species for management purposes. These species do not require management or mitigation (IM OR-2003-054).
Special Status Species and Survey and Manage (not including T/E): Plant Species/Habitat	Not Affected Fungi Not Present Vascular and Non-Vascular	**Bureau Special Status Fungi – NOT AFFECTED** The project area was not surveyed for fungi, as pre-disturbance surveys for Special Status fungi are not practical, nor required per BLM – Information Bulletin No. OR 2004-121, which states "If project surveys for a species were not practical under the Survey and Manage standards and guidelines (most Category B and D species), or a species' status is undetermined (Category E and F species), then surveys will not be practical or expected to occur under the Special Status/Sensitive Species policies either (USDA FS and USDI BLM, 2004, p.3)." Current special status fungi were formerly in the aforementioned S&M categories which did not consider surveys practical, and are therefore exempt from survey requirements. With the recent re-instatement of Survey and Manage Protocols, these species were placed back into their respective S&M categories (9 species in B, 1 species in F) – none of which require surveys under S&M protocol. District wide, the Medford BLM has ten Bureau Sensitive (BSO) fungi species; six are suspected to occur here, while the remaining four have been documented. Of the four documented species, only one, *Phaeocollybia olivacea*, has been found in the Glendale Resource Area, approximately 20 air miles from the Planning Area. Additionally, the microhabitat of the fungi site differs from the microhabitat of the August Knob units that were burned in 2005 (Blossom Fire). Based on the outcome of utilizing the 'Likelihood of Occurrence Key' provided from the BLM Oregon State Office, there is a "low likelihood of occurrence and low risk to species viability or trend toward listing," for sensitive fungi species potentially located in the Planning Area . While it is possible that this

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Special Status Species and Survey and Manage (not including T/E): Plant Species/Habitat (continued)	Not Affected Fungi Not Present Vascular and Non-Vascular	project is occurring within potential habitat for some species, there is very little information available describing the *exact* habitat requirements or population biology of these species (USDA,USDI 2004 (2004 Final SEIS vol.1) p. 148). The 2004 FEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines addresses this type of incomplete and/or unavailable information (USDA, USDI 2004, pp 108-109). However, the *2004 Record of Decision* (ROD) *to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines*, offers a broad scale prospective of this current situation in stating, "Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed. Reserves have not been surveyed to the same degree as Matrix and Adaptive Management Area land allocations. The Reserves were not surveyed because there has been little management-induced disturbance there. The vast majority of pre-disturbance surveys have been located in the Matrix and Adaptive Management Area land allocation (19 percent of the northwest Forest Plan area), so that is where many of the known sites have been found. This does not mean that a disproportionate amount of their habitat is located in Matrix. If these species are truly closely associated with late-successional or old-growth forests (this is one of the criteria for inclusion in Survey and Manage) we can reasonably expect that the large amount of federally managed lands in Late-Successional and Riparian Reserves which provide the most amount of this type of habitat (86 percent of currently existing late-successional forests is in reserves) would also provide, at a minimum, its proportionate share of the habitat to support populations of these species (2004 ROD to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, p.11)." Based on the above information, the likelihood of a Bureau Sensitive fungi species in this project area is very low; the likelihood of a sensitive fungi occurring within a single unit(s) encompassed in the project area is even lower. The likelihood of contributing toward the need to list is not probable. **Special Status Vascular and Nonvascular Plants – NOT PRESENT** Vascular and nonvascular plants were surveyed to protocol in July 2006. Botanical surveys resulted in no detection of Survey and Manage or Bureau Special Status vascular or nonvascular plant species. The *2001 ROD Compliance Review: Survey and Manage Botany Species* report documents that surveys were conducted with no sites found. This report is located within the Project File Record.

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Soil (productivity, erodibility, mass wasting, etc.)	Affected: Soil productivity and erodibility Not Affected: Mass Wasting	Under the action alternative, this project would result in soil disturbance that would lead to a reduction in productivity on approximately 1.0 acres, and potential increased erosion on approximately 2.0 acres as a result of yarding corridors, one landing approximately 0.2 acres in size, and the reconstruction of one temporary ridgeline road. Productivity losses from compaction and topsoil erosion are discussed in chapter 3, Soils and Water Quality. The unit of measure for this element of the environment is whether productivity loss would remain below 5% within each unit, and Planning Area scale, and whether compaction would remain below 12% at the same scales, as required under the Medford RMP. Furthermore, soil disturbance will be qualitatively assessed to ensure that transport of eroded offsite can be minimized to a point that water quality standards would not be exceeded and that fish and essential fish habitat approximately 2.1 miles downstream of closest salvage unit, would not be affected. Mass Wasting potential would not be altered as a result of this project. Generally mass wasting potential increases as a result of over-saturated soils due to increased, or concentrated, ground or surface water flow. This can occur during with some projects that involve mid, or lower slope road construction, activities that result in plugged culverts, or when a considerable amount of the vegetation, which acts to reduce soil moistures through evapotranspiration and stabilize soils with its root structure, is removed from a steep site. For this project road construction and landing expansions would occur along a ridge and would therefore not cause ground or surface water flow paths to be disrupted, or to become concentrated. Salvaged trees would have less than 10% live crowns, and therefore removing these trees would not substantially alter evapotranspiration or interception processes that could result in the over-saturation and instability of soils under some conditions. Additionally, all live trees and brush, pre-existing snags, and downed woody debris would be left within all action areas. This would further ensure that ground and surface water quantities and flow routes are maintained. As such this project would not increase the potential for mass wasting.
Visual Resources	Not Affected	The Planning Area is located within VRM (Visual Resource Management) Class IV category lands. The Proposed Action is consistent with VRM IV visual resource management objectives as stated in the Medford District Resource Management Plan (page 70). Visual Contrast Rating sheets have been created and are located within the Project File Record.

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Water Resources (not including water quality)	Not Affected	The proposed project is within the transient snow zone (TSZ). As a result of past harvest, roads, and the approximately 200 acres of high intensity burn and dozer fireline construction that occurred during the Blossom Fire within the Mule Creek HUC 6 sub-watershed, roughly 15% of the forested stands in this watershed are less than 30 years of age. Approximately 19% of the acres within the TSZ of the Mule Creek HUC 6 sub-watershed are less than 30 years of age. Forest vegetation is generally considered to be in an advanced stage of hydrologic recovery 20 years after disturbance, and substantially complete by age 30 (Harr, 1989; Adams and Ringer, 1994). Hydrologic recovery is considered to be the point at which hydrologic processes such as peak flows, runoff timing, and water yields within a harvested stand have returned to pretreatment conditions. In watersheds where more than 25% of the forested stands have not hydrologically recovered, there is the potential for increased water yields, and in instances where more than 25% of the TSZ is also in open condition, the potential for peak flow augmentation is also increased (Church and Eaton, 2001). This project would primarily remove dead trees with less than 10% live crown, which are presently not providing canopy closure, on less than 7 acres within Unit 2, and on less than 5 acres within Unit 3. The remainder of the salvage trees proposed for removal are scattered throughout the Planning Area, and as such, would not cause large enough areas of open space to affect hydrologic processes. This project would also include the creation of one landing, less than 0.2 acres in size, that would remove less than 10 green trees (35-44 inches in diameter); the reopening of a road prism approximately 2000 feet in length, that currently has trees less than 15 years of age growing on it; and the removal of some additional green trees, scattered throughout Units 2& 3, to facilitate safe yarding operations. Combined, the number of open acres that would be created by this project, including the removal of dead trees, would be less than 12 acres. This would not cause open space within the Mule Creek HUC 6 sub-watershed, or the TSZ of this HUC 6 sub-watershed to exceed the 25% trigger point for potential changes in hydrologic timing, water yields, or peak flows. Additionally, since research indicates that roads are the most critical impact to a watershed in regards to hydrology and peak flow changes, an assessment was done to evaluate the risk of hydrologic changes resulting from roads individually. The analysis completed revealed that roads currently occupy 1.2% of the acres within the Mule Creek HUC 6 sub-watershed, and 1.7% of the acres within the TSZ of this HUC 6 sub-watershed. According to a studies by Bowling and Lettenmaier (1997), Harr et al. (1975) and others, measurable increases in peak flows from road acreages alone, are not seen until roads occupy at least 3-4% of the acres within small (175-750 acres) watersheds (WPN, 1999). Harr et al. found in one study that 12% is necessary for measurable increases (WPN, 1999).

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Water Resources (not including water quality) continued		Since effects are generally of greater magnitude within smaller watersheds, and since road acres and open space conditions would remain below those levels where measurable changes in watershed hydrology have been shown to occur, this project would not be expected to have a measurable effect on watershed hydrology or water resources within the Mule Creek HUC 6 sub-watershed.
Late-Successional Forest	Proposed Action is in compliance with the 15% Standard and Guideline	Approximately 0.20 acres of late successional forest of the 57,000 acres of federal lands would be harvested (less than 0.002 %). Federal ownership of late-successional forest is approximately 76% (Wild Rogue North WA, p. 68) of federal land within the Wild Rogue North watershed. The Northwest Forest Plan standards and guidelines state that at least 15% of fifth field watersheds should be managed to retain late-successional patches (ROD, C-44) The WA discloses that 60% of the watershed is within LSR, owl core areas and river corridor and wilderness and 17% is within riparian reserves. This means that even if all 18% of the matrix lands were harvested, the watershed would be in compliance with the 15% Standard and Guideline.
Migratory Birds (Species of Concern)	Not Affected	Because the proposed action would not impact these species' habitat types or any use they may be making of the project area, the proposed action would not affect the populations of any migratory Birds of Conservation Concern. See Specialist Report in Appendix 7 regarding rationale for the "not affected" determination.

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Survey & Manage and Special Status Species (not including T/E): Wildlife Species/Habitat	Not Present (Northwestern pond turtle Oregon shoulderband (snail) Townsend's big-eared, bat Pacific pallid bat) (Fringed myotis, northern goshawk, Great Gray) Not Affected Red Tree Vole	<u>Not Present:</u> Northwestern pond turtle (Bureau Sensitive)– There is no habitat for the species in the Planning Area. Oregon shoulderband (snail) (Bureau Sensitive) – There is no habitat in the Planning Area. Townsend's big-eared bat (Bureau Sensitive), Pacific pallid bat (Bureau Assessment) – There are no known sites within the Planning Area. Adequate numbers of snags for Townsend's big-eared bat would remain following harvest. Pallid bat habitat, rock outcrops and cliffs, is not found in units, and harvest treatments are not expected to affect this habitat. Fringed myotis (Bureau Assessment–) - This species utilizes old growth habitat. There are no known sites within the Planning Area. This project is expected to maintain the viability level Northern goshawk (Bureau Sensitive) – There are no known sites within the Planning Area. Suitable nesting habitat is not present in any unit and foraging habitat suitability would not be affected by the Proposed Action Great gray owls (removed from Survey & Manage) have not been observed in the Planning Area, and proposed treatments would not occur within 200 meters of natural openings. Red Tree Vole. Surveys were conducted in the Planning Area and though active red tree vole nests were found in the vicinity of the Proposed Action, no live trees within the prescribed buffer distance of one potential tree height would be removed by the Proposed Action.

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary teams predicted environmental impact per element if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Survey & Manage and Special Status Species (not including T/E): Wildlife Species/Habitat (continued)	Not Present	Not present, habitat for these Bureau Sensitive species: American peregrine falcon, black-backed woodpecker, flammulated owl, Lewis' woodpecker, three-toed woodpecker, white-headed woodpecker, Siskiyou short-horned grasshopper, Chase sideband (snail), Siskiyou hesperian, traveling sideband (snail), and Clark's grebe. Not present, habitat for white-tailed kite and foothill yellow-legged frog, (Bureau Assessment). Not Present: Del Norte salamanders (Survey and Manage) - This species is listed as a Category D species under the Survey & Manage ROD from 2001 (Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, January 2001). Del Norte salamanders are associated with older, closed-canopy forests with rocky substrates dominated by cobble-sized pieces of rock (Welsh and Lind 1995). Habitat is not present within any of the treatment areas and as such the Proposed Action would have no affect on the Del Norte salamander..
Elk Management Area	Not Affected	hermal cover would not be affected by the proposed actions. Page 140 of the WA states to enhance elk populations by improving forage by seeding. The Proposed Action includes seeding disturbed areas which would improve forage.
Port-Orford-cedar	Not Affected	Project is within natural range of Port-Orford-cedar (POC). The proposed actions are consistent with management direction in the Port-Orford-cedar EIS (See POC Risk Key in Appendix 5). Units would be evaluated prior to treatment and appropriate design features would be included as necessary to prevent the spread *Phytophthora lateralis*.

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary teams predicted environmental impact per element if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Re-establishment of Conifers / Conifer regeneration	Not Affected	August Knob Salvage units #2 and #3 are estimated to be less than ten percent stocked with well-spaced suitable conifer seedlings (from plot data). This stocking is generally limited to areas along and on existing roads, skid roads, and landings. Most of it is "dog-hair" with spacings of one to two feet between trees. Much of it would not release. The majority of each unit is void of natural regeneration. Regeneration surveys done in mid June of 2006 did not find any conifer germinants from after the fire within any of the plots or between plots (While it is not a consideration for these units, first and sometimes second year germinants are not recorded as stocking during regeneration stocking surveys. Mortality rates on these trees can be high). Reforestation of conifer stands through natural regeneration is not an RMP assumption. Artificial regeneration, usually through planting, is assumed unless natural regeneration on the site is sufficient to reach target stocking levels. For these units, natural regeneration is not presently distributed across the proposed treatment areas so planting is planned to occur in Units 2 & 3 and the dozer fireline through the Blossom Fire Rehabilitation and Stabilization categorical exclusion analyzed in 2005.

*Bureau Special Status Species Policy for sensitive species requires that the BLM protect, manage, and conserve those species and their habitats such that any Bureau action would not contribute to the need to list any of these species. Bureau Assessment species, which are not eligible for federal listing status like sensitive species, but are of a concern in Oregon might, at a minimum, need protection or mitigation in BLM activities. Bureau Tracking species are not considered special status species for management purposes. These species do not require management or mitigation (IM OR-2003-054).

Table 3. Aquatic Conservation Strategy Summary. This table lists the four components of the Aquatic Conservation Strategy (RMP pp. 22-23) and the interdisciplinary teams predicted environmental impact per component if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

Components	Consistency With ACS	Remarks /References
Riparian Reserves	Consistent	There are no management actions proposed in riparian reserves except for felling and leaving trees on site. The only proposed action within riparian reserves includes the felling of roadside hazard trees for public health and safety. Felled hazard trees would remain on-site to augment coarse woody debris levels. As such, the Proposed Action and Mitigation #1 would not prevent the attainment of riparian reserve objectives identified in the Medford District RMP
Key Watershed	Consistent	The Proposed Action is not located within a Tier 1 Key watershed.
Watershed Analysis	Consistent	*Wild Rogue North Watershed Analysis* (WA), October, 1999. The Proposed Action is consistent with the following WA recommendations: 1/ None of the roads proposed to be used in the August Knob Salvage project were identified in Appendix L or Map 23 of the WA for road closure/decommissioning. As such, Alternative 2 (Proposed Action) does not include the closure or

		decommissioning of the roads proposed for log haul. However, the Proposed Action does include the reconstruction of a spur road to access units #2 and #3. This spur road would be decommissioned; 2/ Page 138 of the WA states that new roads should be constructed along ridges as much as possible to reduce sedimentation to streams. Although the Proposed Action does not entail new road construction, it does include new construction (expansion) of a landing (0.18 acres). This landing would be constructed along a ridge to reduce the potential for sedimentation to a stream. Mitigation #1 does not include new landing construction; and 3/ Page 140 of the WA states to enhance elk populations by improving forage. The Proposed Action includes seeding disturbed areas which would improve forage.
Watershed Restoration	Consistent	Although the proposed action is not a component of the resource area's watershed restoration program, it will not have an adverse effect on restoration efforts. Specifically, B-30 of the Northwest Forest Plan states that one of the most important components of a watershed restoration program is the control and prevention of road related run-off and sediment production. The Proposed Action does not entail new road construction, and the log haul and post treatment road maintenance would not increase road related run-off and sediment production to a level that would adversely affect watershed restoration efforts (See Chapter 3).

APPENDIX 3
PUBLIC SCOPING COMMENTS TO AUGUST KNOB SALVAGE AND BLM RESPONSE

The Glendale Resource Area accepts public comment of proposed forest management activities through the quarterly BLM Medford Messenger publication. A brief description of proposed projects, such as August Knob, a legal location and general vicinity map are provided along with a comment sheet for public responses. The August Knob Salvage was included in these quarterly publications beginning in winter, 2005.

George Sexton for Klamath Siskiyou Wildlands Center (KS Wild)

comment a: As the BLM prepares its environmental analysis for the forthcoming August Knob salvage timber sale (Blossom fire) we respectfully urge the agency to seriously consider an action alternative that does not call for salvage logging in Late Successional Reserves (LSRs) or within unroaded stands directly adjacent to the Wild Rogue Wilderness. As you know, the Wild Rogue Wilderness is the only designated wilderness area within the Medford District BLM and wildlands surrounding the wilderness provide significantly different recreational, hydrological and habitat values than do the lower elevation fragmented "checkerboard" BLM holdings that are much more ubiquitous.

BLM Response: The BLM is not proposing salvage in LSRs. However, trees that pose a risk of falling onto roads are proposed in the LSR. As mentioned in the Proposed Action (section 1.3 of the August Knob EA) "[t]he only activity planned in the late successional reserve (LSR) and riparian reserve (RR) is felling hazard trees which would be left on site." No projects are planned directly adjacent to the Wild Rogue Wilderness.

The BLM is not aware of "significantly different" recreational, hydrological and habitat values in the August Knob Planning Area. Appendix 2 of the EA identifies elements of the environment that should be analyzed consistent with BLM Handbook 1790-1 which are subject to requirements specified in statute, regulation, or executive order; other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction; and the four components of the Aquatic Conservation Strategy. The Recreation specialist for the project determined that "[t]he Rogue River, a designated Wild and Scenic River, is located approximately 6 miles downstream from the Planning Area. Because of the distance away, the scale of the Proposed Action and the PDFs none of the proposed activities would have any effect on the Outstandingly Remarkable Values (ORV) of the Rogue Wild and Scenic River (scenery, fisheries, water-based recreation). There are no developed BLM recreation sites on public lands in the Planning Area. A field survey found no indication of dispersed recreation activities occurring within the Planning Area (hunting camps, user trails, OHV use, etc.). There are no ACECs within the Planning Area. There are no designated Special Areas such as Resource Natural Areas, or Adaptive Management Areas, within the Planning Area" (Appendix 2). There are no new permanent or temporary roads

proposed for construction, however the Proposal would re-construct one road and decommission it after use.

comment b: In addition to contemplating an alternative that does not salvage log LSRs or wilderness eligible wildlands adjacent to the Wild Rogue Wilderness, we encourage the BLM to consider the findings contained in the following literature as you prepare your NEPA documents for this project.

Attachment 1 is a peer-reviewed study by Donato et al. entitled Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk published in Science on January 5, 2006.

The paper concludes: Our data show that postfire logging, by removing naturally seeded conifers and increasing surface fuel loads, can be counterproductive to goals of forest regeneration and fuel reduction. In addition, forest regeneration is not necessarily in crises across all burned forest landscapes. The results presented here suggest that postfire logging may conflict with ecosystem recovery goals.

BLM Response: See response to "a" above regarding LSRs and wilderness. Units 2 and 3 and sections A,B,C and E are within matrix lands. Only hazard trees would be felled along the road in the LSR. For units 2 and 3, project silviculturist for the August Knob project determined that

> August Knob Salvage units #2 and #3 are estimated to be less than ten percent stocked with well-spaced suitable conifer seedlings (from plot data). This stocking is generally limited to areas along and on existing roads, skid roads, and landings. Most of it is "dog-hair" with spacings of one to two feet between trees. Much of it would not release. The majority of each unit is void of natural regeneration. Regeneration surveys done in mid June of 2006 did not find any conifer germinants from after the fire within any of the plots or between plots (While it is not a consideration for these units, first and sometimes second year germinants are not recorded as stocking during regeneration stocking surveys. Mortality rates on these trees can be high).
>
> Reforestation of conifer stands through natural regeneration is not an RMP assumption. Artificial regeneration, usually through planting, is assumed unless natural regeneration on the site is sufficient to reach target stocking levels. For these units, natural regeneration is not presently distributed across the proposed treatment areas so planting is planned to occur in Units 2 & 3 and the dozer fireline through the Blossom Fire Rehabilitation and Stabilization categorical exclusion analyzed in 2005 (Appendix 2).

comment c: Attachment 2 is a peer-reviewed study conducted by Odion et al. entitled Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains, California published in Conservation Biology, Volume 18, No. 4 August 2004 pages 927-936.

BLM Response: Your reference to Odion's report appears to advance the idea that closed canopy forests are less prone to high severity fires and that roaded areas and plantations experienced more severe fires than multi-aged forests. The Proposed Action would harvest fire-killed trees in a small portion of the Blossom Fire and the reference to Odion does not apply to the August Knob Salvage. The 12 acres of harvesting would not create units over seven acres in size, which would retain green trees and at least one wildlife snag per acre.

As stated in Appendix 2 regarding roads and the risk of fire "Fire Risk is the probability of a fire starting, as determined by the presence of ignition sources. Ignition sources include natural causes such as lightning, and human causes such as burning garbage and debris piles escaping control, improperly disposed of cigarette butts, and unattended camp fires. Fire risk generally increases as human presence increases because these types of activities become more frequent. New road construction potentially allows for increased human activity and therefore increase fire risk. This project proposes no new road construction and is not expected to increase human presence, therefore the existing fire risk is considered to be not affected by the action alternative."

comment d: Attachment 3 is a peer-reviewed study conducted by Beschta et al. entitled Postfire Management on Forested Public Land of the Western United States published in Conservation Biology, Volume 18, No. 4 August 2004 pages 957-967.

The abstract states:

Forest ecosystems are especially vulnerable to postfire management practices because such practices may influence forest dynamics and aquatic systems for decades to centuries. Thus, there is an increasing need to evaluate the effect of postfire treatments from the perspective of ecosystem recovery. We examined, via the published literature and our collective experience, the ecological effects of some common postfire treatments. Based on this examination, promising postfire restoration measures include retention of large trees, rehabilitation of firelines and roads, and, in some cases, planting of native species. The following practices are generally inconsistent with efforts to restore ecosystem functions after fire: seeding exotic species, livestock grazing, placement of physical structures in and near stream channels, ground-based postfire logging, removal of large trees, and road construction.

BLM Response: The reference to Bescta's report et. al. appears to support retention of large trees, rehabilitation of firelines and roads, and, in some cases, planting of native species. The August Knob Salvage would harvest fire killed trees while retaining green trees and wildlife snags. An earlier document, Blossom Fire-BLM Rehabilitation Categorical Exclusion proposed projects that include planting burned areas with conifers and other woody species specific to the site. The effects of proposed ground based logging and associated forest management actions are discussed in Chapter 3 of the EA.

comment e: Attachment #4 is a white paper by Noss et al. entitled "Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States" published by the Society for Conservation Biology on February 24, 2006. We urge BLM timber planners to read and incorporate the following "key findings" from the Noss paper into project planning:

… Research by both ecologists and foresters provides evidence that areas affected by large-scale natural disturbances often recover naturally.
… Post-fire logging does not contribute to ecological recovery; rather it negatively impacts recovery processes, with the intensity of such impacts depending upon the nature of the logging activity.
… Post-fire logging destroys much of whatever natural tree regeneration is occurring on a burned site.
… Evidence from empirical studies is that post-fire logging typically generates significant short- to mid-term increases in fine and medium fuels.
… In forests subjected to severe fire and post-fire logging, streams and other aquatic ecosystems will take longer to return to historic conditions or may switch to a different (and often less desirable) state altogether.
… There is no scientific or operational linkage between reforestation and post-fire logging; potential ecological impacts of reforestation are varied and may be either positive or negative depending upon the specifics of activity, site conditions, and management objectives. On the other hand, ecological impacts of post-fire logging appear to be consistently negative.

BLM Response: The August Knob EA clearly states that the Need for Action is to retrieve some economic value from fire-killed trees. The lands being harvested are on O & C lands and also allocated as northern general forest management areas (NGFMA) under the Medford RMP. One of the primary objectives identified in the RMP is implementing the O & C Lands Act which requires the Secretary of the Interior to manage O&C lands for permanent forest production in accord with sustained yield principles (ROD/RMP, p.17). The project silviculturist determined that "[r]eforestation of conifer stands through natural regeneration is not an RMP assumption for matrix lands. Artificial regeneration, usually through planting, is assumed unless natural regeneration on the site is sufficient to reach target stocking levels. For these units, natural regeneration is not presently distributed across the proposed treatment areas so planting is planned" (Appendix 2). See responses to "a," and "b" above.

The need for harvest treatments in matrix lands is to provide a sustainable supply of timber that would trend toward a forest composed of stands representing a variety of structures, ages, sizes, and canopy configurations generally through the even-aged management silvicultural system (ROD/RMP, p. 187).

As stated in Appendix 2 of the EA "[t]he current condition of the stands proposed for treatments resemble Timber-Litter fuel model TL1. The amount of slash created by the proposed harvest activities may transition the stands to a Slash-Blowdown fuel model SB1. Neither of these fuel models produce flame lengths that compromise the 4 foot

flame length threshold for direct attack, therefore there is no increase in fire hazard due to the presence of activity slash." Therefore there would not be short- to mid-term increases in fine and medium fuels.

See Chapter 3 of the EA for the analysis of effects of the Proposed Action on soil and water resources.

comment f: Attachment #5 is a peer-reviewed article by Trombulack and Frissell (2000) detailing some of the negative impacts of road construction and use on Terrestrial and Aquatic ecosystems. Please address and avoid the harmful impacts detailed in this study. The abstract for the article reads as follows:

Roads are a widespread and increasing feature of most landscapes. We reviewed the scientific literature on the ecological effects of roads and found support for the general conclusion that they are associated with negative effects on biotic integrity in both terrestrial and aquatic ecosystems. Roads of all kinds have seven general effects: mortality from road construction, mortality from collision with vehicles, modification of animal behavior, alteration of the physical environment, alternative of the chemical environment, spread of exotics, and increased use of areas by humans. Road construction kills sessile and slow-moving organisms, injures organisms adjacent to a road, and alters physical conditions beneath a road. Vehicle collisions affect the demography of many species, both vertebrates and invertebrates; mitigation measures to reduce roadkill have been only partly successful. Roads alter animal behavior by causing changes in home ranges, movement, reproductive success, escape response, and physiological state. Roads change soil density, temperature, soil water content, light levels, dust, surface waters, patterns of runoff, and sedimentation, as well as adding heavy metals (especially lead), salts, organic molecules, ozone, and nutrients to roadside environments. Roads promote the dispersal of exotic species by altering habitats, stressing native species, and providing movement corridors. Roads also promote increased hunting, fishing, passive harassment of animals, and landscape modifications. Not all species and ecosystems are equally affected by roads, but overall the presence of roads is highly correlated with changes in species composition, population sizes, and hydrologic and geomorphic processes that shape aquatic and riparian systems. More experimental research is needed to complement post-hoc correlative studies. Our review underscores the importance to conservation of avoiding construction of new roads in roadless or sparsely roaded areas and of removal or restoration of existing orads [sic] to benefit both terrestrial and aquatic biota.

BLM Response: You have not provided specific information to the August Knob Salvage project that identifies any unique effects not already analyzed. There is no new road construction from the project. One existing temporary spur road would be re-opened and decommissioned after use. The August Knob Salvage EA does not assume that there are no effects from the use of roads. The August Knob EA clearly states that it would be in conformance with higher level Environmental Impact Statements (see section 1.5 of the EA) that accounted for anticipated effects to the environment. The August Knob Salvage EA analyzes the effects to elements of the environment which are

subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary teams predicted environmental impact per element if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

comment g: Attachment # 6 is a Forest Service publication entitled Coarse Woody Debris: Managing Benefits and Fire Hazard in the Recovery Forest by Brown, Reinahardt and Kramer published by the Rocky Mountain Research Station in July of 2003.

While this paper studies the fires of 2000 on the Bitterroot National Forest in Montana as a case study to illustrate the ways that simulation models can be used to aid planning, it is particularly relevant to the August Knob because it clearly establishes the different effects, and management implications, of moderate and high severity fire intensity. Please ensure that the NEPA documents for your project clearly delineate between stands affected by moderate and high severity fire intensity.

BLM Response: As mentioned in response to "e" above, the lands being salvage logged are on O & C lands and also allocated as matrix under the Medford RMP. One of the primary objectives identified in the RMP is implementing the O & C Lands Act which requires the Secretary of the Interior to manage O&C lands for permanent forest production in accord with sustained yield principles (ROD/RMP, p.17). Hazard trees felled in the LSR would be left except for those portions landing on the road. The August Knob Salvage Silvicultural Prescription states that only dead and dying conifers that were burned during the Blossom Fire would be salvaged in the two units and that "given current stand conditions, the short-term desired future condition would be a two storied stand with an overstory of existing live conifers (some areas won't have any), a minimum of one snag per acre over an understory of established Douglas-fir and sugar pine regeneration mixed with other native vegetation. Area would meet RMP requirements for class I and class II CWD."

The phrase "high severity fire intensity" is not stated, referenced, or defined in the Forest Service publication. The phrase is rendered meaningless by the fact that fire severity and fire intensity each have their own definitions and should not be confused by making one phrase out of two separate definitions. This makes it difficult to determine the meaning of the request: "Please ensure that the NEPA documents for your project clearly delineate between stands affected by moderate and high severity fire intensity." Because the request is ill-stated and not clearly defined, an interpretation has been derived. After reading the Forest Service publication, a logical interpretation is that the concern seems to be the "potential for high severity reburn" (p. 7) related to the slash created from salvage logging activity. This interpretation is based on one of the purposes of the report which is "to identify a range of CWD quantities that provides for positive values and avoids excessive fire hazard" (p. 1).

According to the publication, "The amount of CWD that provides desirable biological benefits, without creating an unacceptable fire hazard or potential for high severity reburn, is an optimum quantity"…5 to 20 tons per acre for warm dry forest types (p. 7).

Even though CWD and traditional measures of fuel loading from a fire management perspective do not correspond exactly to one another, comparisons can be made using tons per acre. The slash created by the harvest activities may result in a Slash-Blowdown fuel model SB1. This fuel model can exhibit fuel loads between 10 to 20 tons per acre but this range is meant to represent logging slash of live trees. The trees to be cut under the Proposed Action are burned trees with less than 10% live crown remaining. Because the majority of the needles and limbs are no longer present, the fuel loading is expected to be well below 20 tons per acre and will most likely be less than 10 tons per acre, negating any concern regarding the creation of "an unacceptable fire hazard or potential for high severity reburn" (p. 7). Also, the minimal amount of slash created is proposed to receive lop-and-scatter treatments to break up any concentrations of fuels and fire hazard is considered to be not affected by the Proposed Action (Appendix 2).

APPENDIX 4 SILVICULTURE PRESCRIPTION

AUGUST KNOB SALVAGE PROJECT

INTRODUCTION

The August Knob Salvage Project proposes the harvest of dead and dying timber from two units totaling approximately 12 Matrix acres within the Mule Creek drainage (T32S, R9W, sections 18 and 19; T32S, R10W, sections 23, 24, and 26). This area of Curry County burned during the Blossom Fire of 2005. This prescription assesses stand conditions within two stands and recommends treatments to salvage within these stands as well as along fire lines constructed during fire suppression efforts. Falling and removal of hazard trees, salvage of dead and dying trees along roadways within Matrix, as well as falling of hazard trees within the Fish Hook/Galice LSR and within Riparian Reserves is proposed as part of this project. Salvage within the LSR or within Riparian Reserves is not being proposed.

These stands can be characterized as in the Mixed Evergreen Zone as described by Franklin and Dyrness in Natural Vegetation of Oregon and Washington (1973). Douglas-fir is the primary conifer species. Ponderosa pine, sugar pine, and incense cedar are present within the general area. Primary hardwood and shrub species include Pacific madrone, golden chinquapin, rhododendron, and salal. Canyon live oak exists on rockier, poorer areas. Tanoak is a component of nearby stands.

OBJECTIVES

Land Allocation objectives: Units to be salvaged under the proposed action have as general objectives those of lands designated Matrix. Matrix objectives include: production of a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability; providing connectivity (along with other allocations such as Riparian Reserves) between Late-Successional Reserves; providing habitat for a variety of organisms associated with both late-successional and younger forests; providing for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags and large trees; and providing early-successional habitat.

Roadside areas proposed for hazard tree treatment have as their objectives the objectives of Matrix, Late-Successional Reserves, and Riparian Reserves. Hazard tree treatment would be done for safety reasons rather than for stand establishment or development purposes.

Project objectives: The primary objectives of the proposed project are: 1) to salvage dead and dying timber in Matrix areas that burned during the Blossom Fire; 2) to partially

achieve BLM District and State RMP volume commitments (salvage volume from dead and dying trees on Matrix lands would replace "green" volume from live trees that would otherwise be cut to meet volume commitments); and 3) to treat hazard trees along roadways within burned areas.

STAND DESCRIPTION / ANALYSIS / RECOMMENDED TREATMENT

August Knob Salvage units #2 and #3 have similar characteristics. They are predominantly single storied, Douglas-fir dominated stands that were burned through during the Blossom Fire. Stand structure is not complex. Overstories consist primarily of dead and dying Douglas-fir. Diameters range from 8-48"+ dbh. Scorch heights on some trees are 100 feet plus. Understories are generally absent. Both units have limited amounts of forbs, grass, and other herbaceous vegetation that have germinated since the fire. Some resprouting of brush and hardwood species is also evident. August Knob Salvage #2 contains areas of burned canyon live oak and some evidence that manzanita was once within the unit. August Knob Salvage #3 contains limited living rhododendron as well as burned saddler oak, manzanita, and madrone. Natural conifer regeneration stocking levels, from plot data, are estimated to be less than 10 percent (well spaced trees) in each unit. Coarse Woody Debris (CWD) has been surveyed and meets RMP guidelines. Snags and dead/dying trees are present outside of unit boundaries.

Areas along roads and firelines (August Knob A,B,C,D,E) contain limited numbers of dead and dying trees. A limited number of hazard trees exist along roadways.

ANALYSIS

August Knob Salvage units #2 and #3 are Matrix units. Both units, had they not burned, would meet RMP requirements for regeneration harvest. Both units contain numbers of dead and dying conifers in excess of those needed to meet snag requirements for the area. CWD requirements are also met. Natural regeneration present is generally limited to areas along and on existing roads, skid trails, and landings. While there is natural regeneration present in these areas, most of it is "dog-hair" with spacings of one to two feet between trees. Much of it would not release. The majority of each unit is void of natural regeneration. Regeneration stocking surveys done in mid-June did not find any conifer germinants from after the fire within any of the plots or between plots (While it is not a consideration for these units, first and sometimes second year germinants are not recorded as stocking during regeneration stocking surveys. Mortality rates on these trees can be high.)

DESIRED FUTURE CONDITIONS

The short-term desired future condition (0-10 years) for August Knob Salvage units #2 and #3 would be similar to that of a regeneration harvest unit on Matrix. It would be a two-storied stand with 6-8 live conifers greater 20" dbh per acre, snags, CWD, 3-5 large hardwoods per acre and an understory of established Douglas-fir mixed with other vegetation. For these units, however, current stand condition prevents that. Within these

two units, there are not 6-8 live conifers greater than 20" dbh per acre. Large hardwoods are also not present. So given current stand conditions, the short-term desired future condition would be a two storied stand with an overstory of existing live conifers (some areas won't have any), a minimum of one snag per acre over an understory of established Douglas-fir and sugar pine regeneration mixed with other native vegetation. Area would meet RMP requirements for class I and class II CWD.

Long-term desired future conditions (11-100+years) would continue to be similar to that of a regeneration harvest unit. These units would continue to be two-storied stands. Regeneration established in the first decade would provide several opportunities for commercial thinning. The stand would contain a component of tree-form hardwoods. There would be snags and CWD that approximated that found in developing young stands. At one hundred years of age the stand would consist of Douglas-fir and sugar pine greater than 20" dbh and would meet regeneration harvest requirements listed in the current RMP.

PREVENTION/AVOIDANCE STRATEGIES

Planting before competing vegetation occupies the sites would increase the likelihood of timely conifer establishment and reduce follow-up protection and maintenance costs. Timely salvage would reduce the likelihood of unsafe working unsafe for forest-workers doing forest management treatments from developing.

RECOMMENDED TREATMENT

August Knob Salvage units #2 and #3: Salvage dead and dying conifers that were burned during the Blossom Fire. Use 10% live crown ratio (LCR) as the point for determining whether a tree should be considered live or dead/dying. Consider a tree live if it has a LCR of greater than ten percent. Consider a tree dead if it has a LCR of ten percent or less. Within units, retain a minimum of 1 snag or dead/dying tree greater than 20 inches dbh per acre to meet snag requirements. Trees that were snags before the fire and cull snags may be left to meet this requirement. For unit #2, dead/dying trees outside of the unit to the south and west will count towards meeting area snag requirements. For unit #3, dead/dying trees to the south between the unit and road 32-9-19 and to the north and east of the unit will count towards meeting area snag requirements. Retain existing down woody material within units.

Yarding Method: Tractor yard where slope permits within August Knob Salvage #3. Cable yard August Knob Salvage Unit #2 as well as any area within Unit #3 too steep for ground based (tractor) yarding.

Treatment of Slash: Lop and scatter slash.

Establishment of Conifer Regeneration: Plant salvage units with a mixture of Douglas-fir and sugar pine. Plant temporary road used to access units #2 and #3 after decommissioning with a mixture of Douglas-fir and sugar pine. Conduct follow-up

protection and maintenance treatments through stand establishment. Interplant as needed to meet stocking standards.

Note: August Knob Salvage units #2 and #3 are currently scheduled to be planted fall of 2006 or spring of 2007. Depending on whether or not there are delays in salvage operations, this planting may occur before the units are salvaged. Planting is to be done at this time to: 1) capitalize on clear planting sites (areas were burned); 2) to get seedlings in the ground before competitive vegetation occupies the sites; and 3) should salvage operations not occur, to get seedlings in the ground before areas become unsafe for forest-workers to plant. (Should salvage operations not occur there may be a period of time where the danger of falling snags, limbs, and tree tops would make working within the units unsafe.)

If planting occurs prior to salvage operations, evaluate stocking levels after salvage. Interplant as needed to meet stocking standards. If salvage operations are delayed or do not occur, monitor units as to whether or not dead trees and canopy create unsafe working conditions. If conditions are judged safe, conduct interplanting, protection, and maintenance treatments as needed to meet stocking standards. If conditions are judged unsafe, stay out of units until treatments can be safely done. Although these units are small in size (total acres), failure to be able to do treatments designed to meet stocking standards and other follow-up treatments such as precommercial thinning may affect yield.

Roadside / Fire line Treatments:

Salvage and Hazard Tree treatments (Matrix only-segments A,B,C,E): Fall and line to road dead trees as well as hazard trees (hazard trees may be green or dead) within 75 feet of the road or fire side of the fire line. For hazard trees more than 75 feet from roads, fall those that have the potential to fall on roads. Line to road portions of those trees within 75 feet of the road. On the fire side of fire lines, fall and line dead trees within 75 feet of the fire line. Tractor to roads. No hazard tree removal along fire lines. Lop and scatter slash.

Hazard Tree treatment (LSR-segment D, RR-within segments A,B,C,E)**:** Fall hazard trees along roads within the LSR and within Riparian Reserves portions of the project. Retain trees on site. Limb boles. Lop and scatter slash.

Establishment of Conifer Regeneration: Evaluate affected areas for need to plant seedlings. Plant and conduct follow-up treatments as needed to meet target stocking levels. Plant with a mixture of Douglas-fir and sugar pine.

SILVICULTURAL OPTIONS CONSIDERED: A prescription that retained a greater number of dead and dying conifers was considered but was rejected. Retention of 6-8 live conifers per acre greater than 20"dbh (across the range of diameters) within regeneration harvest units on Matrix lands is designed to approximate minimum "older-forest" conditions at age 100 years as well as provide trees for recruitment of snags and CWD throughout the development of the stand. Retention of additional dead and dying conifers within this project would not contribute towards meeting those goals. Snags are present outside of units to be treated. Retention of additional dead/dying trees within the units is not needed to meet snag requirements.

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APPENDIX 5 PORT-ORFORD-CEDAR RISK KEY ANALYSIS

Port Orford Cedar Risk Key Analysis for the August Knob Salvage Project
(Risk Key is from Alternative 2 of the FSEIS for Management of Port Orford Cedar in Southwest Oregon 1/2004)

6/27/06

	QUESTION				Access and for areas of roadside salvage/hazard tree removal (75' from edge of road)														
			August Knob Salvage #2	August Knob Salvage #3	County Road #27	33-7-2	32-8-1.1	31-9-35	32-8-31	32-9-16	32-9-20	32-9-18	32-9-18.1	32-10-26	Unit #2 skid road	Fire (cat) lines in project			
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		No	No	No	No	No	No	No	No	No	No	No	No	No	No			
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		No	No	No	No	No	No	No	No	No	No	No	No	No	No			
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		No	No	No	No	No	No	No	No	No	No	No	No	No	No			

	If the answer to any of the three questions is yes, continue.																		
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routs; farther for drainage features; 100 to 200 feet in streams.
2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

No mitigation or special measures required for management of POC and POC root disease.

APPENDIX 6 MAPS

APPENDIX 7

SPECIALIST REPORT- MIGRATORY BIRDS

To: Katrina Symons, Field Manager, Glendale Resource Area
From: Marylou Schnoes, Wildlife Biologist, Glendale Resource Area
Re: 'Not Affected' rationale regarding migratory birds (OR-118-06-009)
Date: August 2006

Analysis of Proposed Action Effects on Birds of Conservation Concern
for
August Knob Timber Sale

As a result of Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds," the USDI Bureau of Land Management (BLM) and Fish and Wildlife Service, and USDA Forest Service were directed to create a Memorandum of Understanding (MOU) in 2002 to conserve migratory birds (those species listed in 50 C.F.R. 17.11) protected by the migratory bird conventions (the Migratory Bird Treaty Act [16 U.S.C. 703 – 711], the Bald and Golden Eagle Protection Acts [16 U.S.C. 668 – 668d], the Fish and Wildlife Coordination Act [16 U.S.C. 661 – 666c], the Endangered Species Act of 1973 [16 U.S.C. 1531 – 1544], and the National Environmental Policy Act of 1969 [42 U.S.C. 4321 – 4347]). Though the MOU has not been finalized, the BLM does follow its recommendations regarding actions affecting Birds of Conservation Concern in the August Knob Timber Sale proposed action.

Table 1 below summarizes the potential effects of the proposed action on the Birds of Conservation Concern known to occur on Medford District BLM-managed lands.

Table 1: Birds of Conservation Concern for Medford District BLM

species	**habitat** (Kemper 2002)	**Presence in August Knob Project Area, and effect**
peregrine falcon	cliffs	Unknown, habitat not present in project area
flammulated owl	ponderosa pine forests with closed overstory and open subcanopies	Unknown, habitat not present in project area
olive-sided flycatcher	green coniferous forests with snags	Likely present in project area. Habitat adjacent to timber sale units, but not affected by proposed action
rufous hummingbird	early successional stages with flowering plants	Foraging habitat likely present in timber sale units. Nesting habitat adjacent. Neither affected by proposed action
Lewis' woodpecker	ponderosa pine stands	Unknown, habitat not present in project area
white-headed woodpecker	large ponderosa pines, rarely true fir stands	Unknown, habitat not present in project area

The four species with "unknown" presence are birds that are considered rare in all of southwest Oregon, have extremely specialized habitat requirements and whose nesting habitat is not likely to occur in the project area. Only the peregrine falcon would be expected to pass through the project area. Such use would be ephemeral, as hunting forays and would not likely be affected to any observable level by the harvest activities or post-sale changes in habitat. This is because the home range of the falcon is approximately 25 to 100 square miles (Csuti et al 2001) or 16,000 to 64,000 acres; while the habitat might be only slightly modified for the falcon's use over 12 acres.

The olive-side flycatcher is known to use green (as opposed to fire-consumed) coniferous stands with uneven, mixed-age canopies that contain occasional snags, from which it forages (Csuti et al 2001, Kemper 2002). Such stands are adjacent to some of the proposed harvest sites, but would not be affected by the proposed action; because the stands used by the flycatcher would not be entered. And their suitability for use by the flycatcher be unaffected by the removal of trees in nearby stands. The rufous hummingbird forages on nectar-producing flowers, which probably occur in abundance in burned areas both inside and outside the harvest units. While the actual yarding of trees may remove some flowering plants in the area of the skid trails, the amount removed would not be measurable compared to the amount remaining even within the individual 7th field watersheds in the project area, and the proposed action would not affect the post-harvest species' use of the stands in any measurable way. This hummingbird nests in green stands of coniferous or deciduous trees, habitat found outside the proposed harvest stands and which would not be affected by the proposed action, which is proposing to treat fire-consumed stands only, where this hummingbird does not nest.

Because there are no project impacts on these species' habitat types or any use they may be making of the project area, the proposed action would not adversely affect the populations of any migratory Birds of Conservation Concern.

Literature Cited

Csuti, Blair, Thomas A. O'Neil, Margaret M. Shaughnessy, Elanor P. Gaines, and John C. Hak. 2001. Atlas of Oregon Wildlife: Distribution, Habitat, and Natural History. 2nd Edition. Oregon State University Press, Corvallis. 526pp.

Kemper, John. 2002. Southern Oregon's Bird Life. Outdoor Press, Medford, Oregon. 328pp.

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24 August 2006